A STUDY OF THE RELATION OF PARENT-CHILD INTERACTION AND CERTAIN PSYCHOLOGICAL ATTRIBUTES OF ADOLESCENTS IN HONG KONG

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ABSTRACT

The study deals with the relations of parent-child interaction among Hong Kong adolescents with certain psychological attributes including intellectual abilities, attitude to home, social interest, academic motivation and popularity. In view of the emphasis on examination results in the Hong Kong community, it was also found useful to investigate aspects of the relations of parent-child interaction by itself, and together with the above psychological attributes, to school achievements.

By the use of the Ginsburg Parent Image Differential Test, twelve parental factors were identified for parent-child interaction. The AH4 Test was used to assess intellectual abilities. Original measures were constructed for the other psychological attributes. The subjects were students aged around 17 in Form IV classes of a stratified random sample of Hong Kong Anglo-Chinese schools where English was the main medium of instruction.

Certain hypotheses were tested by the use of the following statistical techniques: product moment correlation, principal components analysis, stepwise multiple regression, and analyses of variance and covariance. Considering the particular social context in Hong Kong, cross-cultural evidence from U.S.A., Mexico, and Singapore was also examined and found to support the argument that the Hong Kong situation was rather unique. Hence interpretation of the results was restricted to the cultural, social, economic, and educational pattern of Hong Kong.

The main trends clearly identified in this study were that mothers tended to be more responsible for significant aspects of their adolescents' cognitive development and fathers more so for the affective characteristics. In general, more

pressures were put on the boys than on the girls by parents, especially by the mother: boys, too, proved generally superior to girls in cognitive abilities, but inferior in the affective traits. These findings were found to be in agreement with the boy-centred society and patriarchal home practices of traditional Chinese culture in Hong Kong.

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CHAPTER ONE

INTRODUCTION

1. The General Trends

Prior to the advent of formal educational systems in the various countries, nearly all learning and teaching took place incidentally within the home and in informal practices of different kinds within the tribal or group environment. The emergence of certain individuals as "teachers" and the development of schools as places where children were sent by their parents to be taught by others changed all that and we now have a different, largely outside-the-home "education system". It would seem that the educational emphasis has shifted from home to school -- but is it really so, and one wonders by how much? Research over the last fifty years and particularly during the last decade has shown that achievements and attitudes in the formal place of learning, the school, still rest heavily on the informal learning and teaching that has occurred, unconsciously perhaps, at home prior to the child's entry to school. It appears that the cultural standard and psychological impact of the child's home conditions continue to have a relevance in the child's total learning.

Psychologists, educators and sociologists now seem to agree that the family is normally the most significant single influence on the early development of the child. Indeed, the home, with its close ties and personal inter-relationships, emerges as the environment which makes the strongest bid to remain the most pervasive of all learning and developmental influences throughout the life of many individuals. We may feel confident then, that

the educational function of the family remains important in modern society, and even more so because it appears also to determine future attitudes towards education. There is no doubt that most early social learning is experienced within the family, which providesthe child with his initial identity, and it is in the home that the child obtains his first impressions of people, whether good or bad. The child clearly relates to his specific family and is influenced by that family's characteristics and customs. Through the parents there develops what may be termed the basic emotional and social education of the child, although the average parents are seldom equipped with adequate knowledge and training to optimise this particular function.

In addition to the above considerations, we have evidence to believe that the socio-economic background of the child's family has an important bearing on the child's upbringing. However, recent findings seem to suggest that the psychological environment has more far-reaching effects on the development of the child's cognition and emotion than the merely physical or material environment, and this is especially true in the West since most homes in Western culture are above the level where material conditions are likely to affect adversely the developing abilities and other attributes of the child.

To move further afield to specific areas, we find that in the Hong Kong situation, parents who can afford to send their children to secondary schools are generally in the middle- or upper-income groups, and therefore material aspects may again not be a critical consideration. The present study takes account of these considerations and aims to investigate certain psychological aspects of the home environment and their relation to particular psychological attributes of adolescents in Hong Kong.

2. The Particular Cultural-Educational Problems of Hong Kong

In order to have a better understanding of the Hong Kong situation and problems, the current cultural-educational scene may be reviewed briefly. The population of Hong Kong is over four millions, of which about 99% are Chinese. Cantonese is the major dialect spoken among the Chinese community. However, English has been up till now the only official language in government and also in most private enterprises. Though Hong Kong is a bilingual society, English is essential for academic and business purposes and has marked commercial value locally. Both spoken and written English is desirable for entry into the various professions and to overseas universities. Minority groups in the order of their percentage of the total population include British, American, Portuguese, Japanese, German, Dutch, French, and Italian. Hence, Hong Kong culture is primarily in the Chinese tradition interwoven to varying degrees with Western ideas and practices.

Though Hong Kong is very much Westernised, especially in the urban areas, nearly all the ancient Chinese customs and festivals are still observed by most Chinese residents. Homes, particularly those in the rural areas, are still managed in a patriarchal fashion, with power and authority vested in the father or in the male head of the family. The Chinese in Hong Kong still have very strong family ties, though less so now perhaps than in the past. Strong family restrictions on children still prevail, particularly within the less educated homes.

Whilst there is no class system as such in Hong Kong, the gap between the rich and the poor is very great indeed and marked inequalities and social injustices continue. However, the affluence of the people is rather precarious, and there is a considerable amount of social mobility -- mainly upwards through

education. Religious differences appear to parallel the economic divisions, the religion of the low-income group being almost exclusively Buddhist, while that of the middle- and high-income groups is usually Christian and either Catholic or Protestant.

Since Hong Kong is a highly commercial and capitalist society and a "laissez-faire" policy prevails, life is highly competitive. Most parents, including those of poor families, desire as extended an education as possible for their children in order to upgrade their status in society. Because of the particular situation in Hong Kong, parents attach great value or importance to the intellectual abilities and academic achievements of their children. Many parents no doubt look on education for their children as a means by which their own high aspirations can be realized, thus it is considered to be the way by which their children can surpass their parents' position in life. Hence most children in Hong Kong are under constant parental pressure to do well in school, and they are well aware of the consequences of failure and also as a result academic examination results are given undue importance. Parents' child-rearing attitudes tend to those associated with rather strict control and authoritarianism, and there is a close parental surveillance, especially of boys, sometimes to the extent of what outsiders might term over-protection. In general, present-day Hong Kong teenagers appear to be more oriented towards the future, with the boys showing a stronger tendency to reject the traditional method of child-rearing and favouring a greater degree of individualism. There is undoubtedly nowadays some conflict of opinion and practice in these family areas. It would therefore appear to be of great interest and also of some importance to carry out a study of parent-child relationships in terms of the Hong Kong children's

cognitive and affective status.

Currently, education in Hong Kong is neither free nor compulsory at the secondary level, though the government introduced free primary education in September 1971. There are three major stages of education in Hong Kong, primary, secondary and tertiary, and the normal ages for entry are 6, 12, and 19 years respectively. Nearly all primary schools are Chinese, with Cantonese as the medium of instruction, and English as a second language, There are four types of secondary education: Anglo-Chinese grammar schools, Chinese middle schools, general secondary technical schools, and secondary modern schools, in the order of size of their student enrolments. The Anglo-Chinese grammar schools are by far the most important, however, in terms of their numbers and economic value, there being at this present time 229 such schools as against 114 Chinese middle schools, 11 secondary technical schools, and 5 secondary modern schools in 1970-71. It should also be noted that the enrolment for Anglo-Chinese grammar schools is about four times that for Chinese middle schools. For further education, there are three Colleges of Education (i.e., teachers' colleges), one Technical College, and two Universities. The University of Hong Kong (English-speaking) was established in 1911. It now has full faculties of arts, science, social science and law, medicine, engineering and architecture, and covers all the main professional disciplines except dentistry. The Chinese University of Hong Kong (Chinese-speaking) was established only in 1963 and is a federal university with three constituent colleges. It has arts, science, commerce and social science faculties, and tends to be moving towards the development of large professional schools, such as journalism and business administration. The two universities take only a very small

proportion (about 2%) of the school leavers and have not been able to provide enough places to cope with the demands of students and of their parents.

The present study centres its investigation in the Anglo-Chinese grammar schools and the secondary technical schools, since the medium of instruction in these two types of school is English and this in turn makes it possible to use psychological tests in English. It is also in these schools that the future of Hong Kong appears to be invested, and where the two cultures of Chinese and English mingle most freely and easily. It seems appropriate therefore, since the emphasis in Hong Kong is on English and on the academic subjects, to focus the present study on those institutions where English is the common language of instruction and where the bi-cultural context of Hong Kong society is best seen in its school setting.

CHAPTER TWO

REVIEW OF RELEVANT LITERATURE

There are available a wealth of sociological as well as psychological research studies dealing in various ways with the relation of home environment to the cognitive and affective growth of children. However, the field of enquiry must be restricted and only the more important contributions to this area of knowledge and particularly those which lead to the formulation and development of the hypotheses of the present study, will be reviewed here.

1. Researches Concerned with Material Home Environment.

In England, the classical study of Gordon[1] (1923) on the intellectual ability of canal boat children revealed that they were inferior in ability to children brought up in a more normal educational environment. Gaw[2] (1925) further showed that there was a greater deficiency in the more verbal aspects of their ability as measured by the Binet-Simon test than in their ability as revealed on performance tests. In most of these types of researches quoted, it is quite possible that the parents and children were also genetically inferior, and therefore it should not be argued that they prove that poor environment as such caused the observed child deficiencies. It may be agreed that the "in toto" hereditary explanation is unlikely, but its possible effect should continue to be recognized.

Wheeler[3] (1932, 1942) studied East Tennessee mountain children and found that the test scores at all grades were higher than the test scores for comparable grades ten years before, and he attributed the difference to the improved conditions, both economic and educational, of the area. However, he found that the children in less favoured areas did not develop intellectually at the same rate as children in more favoured areas.

Havighurst and Janke[4] (1945) carried out an extensive study on all children between 10 and 16 years of age in an American Mid-West Community. They found that children from families of higher socio-economic status tended to do better in all tests of ability than children of lower status. Fleming[5] (1943) also obtained a positive correlation between socio-economic status and test performance. Cattell[6] (1934) confirmed this relationship between parental occupation and child intelligence. Vernon[7] (1947) also found significant variations of intelligence among adult naval recruits with occupation, age, and locality of residence.

Piaget[8] (1950) considered that intellectual operations are acquired by interaction between organism and environment in a lawful 'sequence', while Hebb[9] (1949), from his neurophysiological studies, distinguished intelligence A, which he defined as the innate genetic potentiality, neither observable nor measurable, from intelligence B, which he interpreted as the present mental efficiency of the individual resulting from his interaction with his environment. Vernon[10] (1960) accepted Hebb's view of intelligence A and B, but pointed out that available intelligence tests are imperfect measures of intelligence B, and hence introduced the term intelligence C to refer to that aspect of intelligence B which is measured by intelligence tests. Cattell[11] (1963) considered that the general factor which emerges from correlations between batteries of varied tests is in effect an amalgam of two components, which he called fluid and crystallized intelligence. Fluid intelligence he thought represents the influence of biological factors on intellectual development, whereas crystallized intelligence is the result of the skills and concepts which have become established through cultural pressures, education and experience (i.e., environment).

Campbell[12](1951) studied the cultural level of the home in relation to educational attainment, and found that the following aspects seem to affect secondary school performance appreciably: availability of music, books, newspapers, journals, radio programmes, pictures, ballet and concert going. He pointed out that most attention has been concentrated upon one aspect of the home environment, namely the socio-economic status of the parents, and that very few investigations have been made by objective assessments of home conditions; therefore it may be considered that the present evidence on the effects of home environment is far from conclusive.

Eells et al.[13] (1951) reported that there exists a very clearcut relationship between social status and measured intelligence, especially where the measure of intelligence is based on tests of verbal ability. The differences were also found to increase with age. Arvidson[14] (1956), in his investigation of some factors influencing the achievement of first year secondary modern school children, found that the most important factor appeared to be the home conditions and that the influence of the home environment was greater on verbal ability than on numerical achievement. He further maintained that speech, expression, even thought itself, are all conditioned by home background, and these are fundamental to proficiency in English. Watts[15] discussed the part played by language in intellectual development in a useful publication as early as 1944(revised 1963). Burt's[16] study (1937) also suggested that poverty, population density, family size, poor health and inadequate general knowledge were the aspects of low social class which were associated with backwardness in school. It should be pointed out that better class homes certainly provide advantages to the children, but also that generally the professor

or business executive type of parent may be considered most often to be more intelligent than the unskilled labourer, so that part of the inferiority of the latter's children may be thought to be genetic in character.

Fraser[17] (1959), in her study in Aberdeen schools, showed that the relationship between intelligence and home environment factors was very high. She also found that the child who is well equipped verbally is able to score highly on intelligence tests, even non-verbal ones. Bernstein[18](1958, 1959, 1961) maintained that there was very little difference between a working class group and a public school group with respect to non-verbal ability but that verbal ability was significantly lower for the working class group. He explained his results as follows:

> "Because of the different structuring of the working-class environment the working-class child does not learn a language which is structured to mediate personal qualifications but is limited to expressive symbolism and a public language."

In other words, in the higher income groups, there is early pressure on the child to verbalise his feelings and abstract ideas. As pointed out by Vernon[19](1969), the working class child who does not normally get training in using language to convey abstract ideas, is handicapped in general intellectual development and starts his schooling at a considerable disadvantage, compared with the middle class child. Stott[20](1967) also asserted that the mode of verbal communication between a mother and her preschool child is vitally important to the development of the latter's cognitive structure and hence to his later educability in school. These observations would appear to be reasonable and generally acceptable in the present context.

While acknowledging that in general there is a difference of about 20 points between the mean IQ's of the children of

professionals and those of the children of unskilled labourers, Anastasi[21] (1958) drew attention to the fact that the correlations between home ratings and intelligence vary with the content of the home-rating scales, the nature of the intelligence test, and the size and nature of the sample used. However, she said that in general, the correlations between home-ratings and intelligence found between the ages of 3 and 18 years cluster around 0.40, though they range from 0.20 to slightly over 0.50, and that correlations with social status are higher in those abilities (particularly verbal) that tend to be favoured by a superior social environment. She agreed that good socio-economic background favours intellectual development. She also made the interesting point that bilingualism per se need not handicap a child and that it is not the interference of the two languages, so much as the restriction in the learning of one or both to limited areas, that produces a handicap. This is of particular relevance to the Hong Kong situation where the majority of secondary schools are bilingual.

Other studies relating socio-economic home environment to intellectual abilities, and in particular to verbal abilities include those of McNemar, Seashore, Jersild, Havighurst, Vernon, Ravenette, Reid, Douglas, Wiseman, Thom, and the Scottish Mental Survey. McNemar[22] (1942) pointed out that the mean IQ's of children of professional fathers were in general appreciably higher than those of children having fathers with lower occupations, and Seashore et al.[23] (1950) reported that mean IQ's varied from 110.9 for children of professional and semi-professional men to 94.6 for children of rural and urban labourers and farm foremen. Both Jersild[24] (1960) and Havighurst et al.[25] (1962) confirmed that in general children of higher social class (i.e. of better

socio-economic status) tend to have a higher average level of intelligence.

As regards verbal abilities, Vernon[26] (1960) emphasized that children from the middle class, and particularly professional homes (where they are likely to hear richer and more accurate speech), tend to acquire a better and more enriched vocabulary than those from working class homes. Ravenette[27] (1963) found that for working class children, scores on verbal tests are significantly lower than perceptual scores, and the difference (for some reason) is more clearly marked for girls than for boys.

From his Jamaican study, Reid[28] (1964) concluded that mental associations which become established very early in life -- (e.g. from preschool experiences) -- remain a permanent part of the individual and exert continuing effects on mental growth and educational development. He indicated that loss of development during the early period may not be recoverable at later ages, and that the home is almost solely responsible at this stage for providing a sufficiently enriched and stimulating environment for the child. In England, Douglas[29] (1964) recognised that children who are encouraged in their studies by parents do appreciably better in picture intelligence tests as well as in attainment tests of reading-comprehension and arithmetic. Wiseman et al.[30] (1967) asserted that socio-economic class and its associated conditions of better child-care still make substantial differences to children's intelligence and achievement. In his Guyana study, Thom[31] (1969) found that the selection test scores (arithmetic, English, non-verbal and verbal intelligence) are affected by the parental, socio-economic and environmental background of the testees. In Scotland, the Scottish Mental Survey[32] (1953) also revealed that there was a close correspondence between father's

occupational class and the mean test score of children.

Other aspects of environmental influence have also been investigated from time to time with significant results. To mention a few, Douglas[33] (1964) found that eldest children with one or two siblings do better in secondary selection examinations. As early as thirty years ago, Bonney[34] (1942) reported that family size neither explained nor described adequately the personality of any particular child. But, as pointed out by Nisbet[35] (1953), size of family in itself may be a causal factor in poor mental development, just as poor language stimulus in the home has been shown to be if they both correlate with low intelligence, as appears to be the case. Berdie[36] (1943) studied interests, and Maas[37] (1955) aspirations in relation to social environment. Berdie found that the income and occupational status of fathers seemed to govern, to some extent, the interests of their sons: technical interests predominated in the lower income groups, while business interests went with higher incomes in many cases. Maas maintained that middle-class fathers were more concerned than working-class fathers about social status, and had higher educational and vocational aspirations.

2. Researches Bearing More Particularly on Psychological Home Environment

In 1947, Burt[38] pointed out that social surveys have been limited chiefly to economic conditions and the material standards of life so that the social attitudes, ideals and behaviour of different groups have been barely touched upon. The main researches on the psychological (as distinct from the material and physical) aspects of home environment in relation to children's cognitive and affective growth are reviewed in this section.

Vernon[39] (1965, 1966, 1967, 1969) on the basis of cross-

cultural studies concluded that socio-economic level and linguistic background are considerably associated with 'g' and with educational and verbal performance, but cultural stimulus in the home gives an even higher correlation with the 'g' factor. The most important single factor in children's performance on 'g' and verbal tests seemed to be the cultural level of the home, parental education and encouragement, reading facilities and probably the speech background. The next most important factor in the home situation is the purposefulness and rationality of the family atmosphere. Economic level as such is subsidiary.

In 1921, 1923, 1933, 1940, Freud[40] presented his psychoanalytic point of view: The child takes the parents as his model because they have qualities the child lacks; he wants to become like them and this Freud called the identification process. Freud postulated the superego (in addition to the id and ego), as representing internally the values and ideals of the society to which the child belongs. Originally, these are conveyed through its parents by means of rewards and punishments meted out in response to its behaviour, but they later become incorporated into its ego-ideal by the process of introjection. The parents are the first adults in contact with the child, and hence they play an important role in being the child's first models with which he identifies.

In 1934, Mead[41] stated that there are two types of conduct involved in the parent-child relationship: imitation by the child, and the sympathetic response of the parent. A child has no 'self' at birth, and his development is dependent on social experience and activity. Self is a structure of attitudes built up, partly by the organisation of the perceived attitudes of others towards himself and towards one another in social acts and situations,

and partly by the organisation of the generalised attitudes of the social group to which he belongs. Staines[42] (1954) pointed out in his study that self and society interpenetrate through education, while Zahran[43] (1966) did a research on the self-concept which he considered to be central in the study of personality. The self-concept provides the key to one of the most successful methods in counselling, namely client-centred therapy.

Goldfarb[44] (1943) investigated the later development of two groups of orphans reared in different settings during their first three years. The first group were adopted into foster-homes where they had more individual attention, nurturance, warmth, and adequate mothering; the other group remained in an institution where they were emotionally deprived, and experienced impersonal care and inadequate mothering. Goldfarb found that institution-reared orphans were relatively retarded, compared with the foster-home children, on all intelligence tests, particularly in concept formation, reasoning, and abstract thinking. Language and speech difficulties were more common among the institution-reared children and persisted long after they left the orphanage. Also, the severe deprivation and the emotional unresponsiveness of their early environment resulted in social and emotional maladjustment, persisting at least into adolescence.

Symonds[45] (1939) indicated that the degree of acceptance or rejection of the child was one of the two most significant considerations in the home, the other being the autonomy of the child as opposed to his rigid control. He further pointed out that rejection, over-attention, and conflict between parents may hinder the development of the child, and that family size also has an effect on the child's socialization process. Groves[46] (1940)

emphasised that the home is the most powerful transmitter of the culture of the group. Parental precepts and examples produce conditioning long before conscious teaching by other institutions of society can reach the child. Parental acceptance and affection, or the opposite, determine the psychological atmosphere surrounding the child. Baldwin, Kalhorn, and Breese[47] (1945, 1949) considered that warmth is the most crucial and pervasive factor affecting the child. The child from a democratic home is more active, more socially outgoing, and higher in intellectual curiosity, originality, and constructiveness. We may sum all this up in the more positive statement that there is evidence to show that the democratic home atmosphere is more conducive to intellectual growth than other types of home control.

Kent and Davis[48] (1957) reported that the type of discipline practised by the mother in the family environment is associated in an interesting way with test performance. Children in 'demanding' homes, where rewards are conditional on achievements, scored highest all round on their test, especially on the verbal materials. Children of over-anxious parents were equally high in intelligence, but their school achievements were found to be far lower. Children of unconcerned and indifferent parents tended to score low on all tests. Porter[49] (1957) also noted that parental interest played a highly significant role in children's academic achievement and in their remaining at school.

In 1948, both Bossard[50] and Frank[51] placed emphasis on the role played by the family in child development. Bossard pointed out that the development of personality involves a constant series of choices; such choices represent a person's values, and such values 'are in large part the result of family conditioning'. Frank developed the point further by saying that it is the family

which is the essential agency for the socialization of the young child and for introducing him to the culture in which he is to grow up and live. Lacking the necessary warmth of parental affection, the young child retains his egocentricity too long, develops fears, and builds up his defences in the form of distrustful and revengeful attitudes of mind. Later in 1952, Bossard and Sanger[52] added that, in a small family, considerable emphasis is placed on individual development, but there may be over-protectiveness. On the other hand, in a large family, there tends to be rather less intimate contact between the parent and any individual child. Three years later, Bossard and Boll[53] (1955, 1956) suggested interesting and fruitful hypotheses about whether family size is actually a psychological as well as a sociological variable in child development. Wallenstein[54] (1937) even attributed inferior development in several aspects of character directly to broken homes. Stern[55] (1949) pointed out that the lack of normal home life and parental identification prevented many of his delinquent subjects from developing their superegos in the normal manner, and he found difficulty in training them to develop proper attitudes of responsibility and service.

Mussen[56] carried out many researches on the psychological development of the child, and in 1963 reported the following findings: Motivation, personality structure, language ability, and social-psychological environment all contribute significantly to intelligence. Inadequate learning opportunities and unstimulating environments handicap the working-class child's performance in intelligence tests. Since the child's IQ score is partly related to the desire to improve his knowledge and problem-solving skills, family experiences which encourage the development of this motive would also lead to high IQ scores, better grades, and

stronger desire for intellectual mastery. Parents are (in effect) intellectual models for identification. Mussen also pointed out that a child's first social learning occurs at home, and his earliest experiences with his family, particularly with his mother, are critical in determining his attitude toward, and his expectations of, other individuals. He agreed that early mother-child relationships influence not only a child's immediate behaviour, but also his subsequent, long-term adjustment, particularly at the adolescent stage, though the exact nature and extent of the enduring consequences of early child-rearing practices have not been clearly established. He noted that parents who severely restrict their child's freedom of movement may suppress his tendencies to explore and to investigate, and thus inhibit the development of motivations for autonomy and independence.

Continuing Mussen's findings, it also appears that strong motivation to learn and to perform well in school is fostered by parental encouragement of competence and exploration early in life. Parental motivation has been found to be significantly related to the student's aspiration level -- children with high self-esteem tend to have parents who are also high in self-esteem. Mussen exphasized that the specific nature of the child's relationships with his parents is far more influential in determining his self-image than is the socio-economic class status. Concerning delinquency, Mussen pointed out that socio-economic factors are not the only significant antecedents. Personal insecurities and psychological problems arising from disturbed family relationships also play a significant role in the delinquent's background. In 1969, Mussen, with Conger and Kagan[57] together put forward a further important point:

> "Although the extra-familial environment (teachers and peers) exerts a strong influence on the motives and behaviours of school-age children, the attitudes and practices of the family are still of major significance. The models that the parents present to the children, and the pattern of rewards and punishments they exercise are determined, in large measure, by two sets of factors -- the unique personalities of the parents and the values of the social-class setting in which the family lives."

In 1950, Allport[58] commented that children and youth need warm affectionate relationships and at the same time need a respect for and a defence of their own self-esteem. Liu[59] found that close and affectionate family ties among Chinese, with patriarchal management in the home, help to provide security and freedom from apprehension for the child or youth. In 1952, Jersild[60] emphasized that it is in the bosom of the home that the self begins to develop and unfold. It is here that the child has his first opportunity to differentiate himself from others, and here too that he is accepted or rejected. Also in 1952, Havighurst[61] pointed out that consistency of discipline received by the child is positively related to the development of his ethical competence, including self-control and self-direction.

In 1954, Miles[62] stressed that shared family experience is important in the development of family interests. Jones[63] (1954) agreed that the first and most important place in a list of environmental factors influencing character development must be assigned to the home. Sears, Maccoby, Levin[64] (1957) added that the most significant aspect of the home is the warmth of the relationship between parents and children, and that mothers are more effective with children particularly when they find ample time to play with them, permit much affectionate interaction with them, and accept their dependency needs. The American psychoanalyst, Erikson[65] (1960) also recognised that the early inter-

actions between mother and child lay the groundwork for the child's development of a sense of trust or distrust in the external world. Medinnus[66] (1961) reported that lack of parental acceptance seemed to constitute an important factor in the poor adjustment of certain first-grade children. In 1964, Swift[67] pointed out that the way in which children are treated by parents is of over-riding importance in determining their perceptions of themselves, while in 1965 Rosenberg[68] agreed that the child's self-esteem is clearly related to patterns of parental behaviour.

The following studies have important implications for the present research and in the area of students' interests. Lovell and White[69] (1958) found that students choosing to study science (even if they were not strongly interested themselves) were significantly more likely to have had fathers who had scientific interests and who had tried to impart to their sons technical knowledge and skills. Meyer[70] (1959) identified a number of sociological and educational factors related to science interest and stated that the home probably exerts a dominant influence. He also stressed that the attitudinal relations between parents and child, and the extent of democratic, stable and co-operative behaviour in the home, seem to have more influence than the social status of the occupation of the father in relation to interest. Fraser's[71] work (1959) revealed that intelligent and well-educated parents who provide the child with a favourable environment tend to encourage the child to develop interests similar to their own and to motivate him to do well at school. Evans[72] (1965) also supported the view that environmental influences play an important part in determining the interests which an individual develops, though heredity may also be involved.

Regarding attitudes, the following studies are of particular

relevance. Newcomb[73] (1955) considered that the family is the most important among the primary groups and that childhood experiences in the family are likely to lead to differential personality characteristics. He particularly pointed out that the ways in which children are indulged, loved, disciplined, or punished depend partly, though by no means entirely, upon forms of family organization, and that attitudes acquired in the family are reinforced by the influence of external reference groups. Becker et al.[74] (1959) reported that authoritarian and arbitrary maternal attitudes were correlated with the presence of certain types of conduct and behaviour problems in children, and that frustration of the child's autonomy led to excessive shyness and timidity. Johnson and Medinnus[75] (1965) also indicated that differences in maternal attitudes and behaviour could produce differences in the personalities of children. In 1965, Dinkmeyer[76] gave the following account:

> "The parents are the child's first teachers. They have a greater influence on him than any other single agency. Many of the attitudes, interests, etc. are somewhat established by the time he reaches school. The parents provide the child with his first social interaction. Their attitudes toward learning and academic discipline serve as a model for him to accept or reject. The child's learning difficulties often relate to some problem in the parent-child relationship."

Stewart and Warnath[77] (1965) are of the opinion that the only way in which a child can make the transition from a state of dependency to one of independence is for him to internalize parental values so that he comes to reward himself for various types of independent behaviour. Evans[78] (1965) realized that, as members of a family, children are surrounded by people subscribing to various opinions about what constitutes a desirable way of life, and in due course, most children develop attitudes resembling those of other members of the family. Toch[79] (1966) said that, with or without deliberate

intent, parents inculcate in their children an infinite number of perceptions, attitudes, and beliefs, while Coopersmith[80](1967) added that mothers of high self-esteem children were more likely to enforce established rules carefully and consistently. Lastly in 1968, Moore[81] asserted that the family is apparently a universal feature of human societies: it uniformly provides for, among other things, initial social placement and early socialization of the young.

Regarding achievement motivation, Jayasuriya[82](1960) found that middle-class grammar school children had higher achievement motivation than middle-class secondary (modern) school children, while Entwistle[83] (1968) emphasized that academic motivation depends both on temperamental traits and environmental variables which interact with each other.

Regarding popularity, the studies of Goldfarb[84](1945), Spitz[85](1945) and Bowlby[86](1953) all showed that children who were institutionalized in infancy and who did not experience consistent 'mothering' , became apathetic and socially unresponsive. Marshall and McCandless[87](1957) examined the relation of adult dependency to children's popularity with peers and found consistently negative correlations between their measure of popularity and their measures of dependence. This suggests that emotional dependence may interfere with some of the child's adjustments to his schoolmates. Bandura[88] (1963) indicated that the parents of aggressive preadolescents and adolescents use physical punishment more frequently and reasoning less frequently than the parents of non-aggressive children.

Symonds[89] (1939) stated that when either or both parents reject a child, he is likely to be aggressive, attention-getting, hostile, hyperactive, jealous, or rebellious. Dinkmeyer[90](1965)

further pointed out that the family is the first and most important socializing agency and that its emotional attachments are crucial in the development of social relationships to others. The child's experiences within the family eventually develop in him a sense of acceptance or rejection by the primary group. He concluded that the more severe the punishment that is received for aggression in infancy and in childhood, the more the child tends to have direct or indirect expressions of aggression and a considerable increase in anxiety about aggressive acts later on. Also the more inconsistency the child experiences, the more marked are likely to be his aggressive tendencies. Children who are raised in a less authoritarian atmosphere in which there is consistency and acceptance tend to be more open to others. They are friendlier and able to respond more adequately in their relationships with peers. He maintained that there is mounting evidence to support the view that discipline in the home affects the child's social development. It also appears that children from autocratic homes tend to be more frequently rated as unpopular with classmates, more quarrelsome, more sensitive to praise and blame, and less considerate than children from democratic homes. Unduly firm or rigid parental controls are thus shown to be detrimental to children's social development. Interestingly enough, in view of popular opinion about the socializing value of large families, children from small families are more frequently acceptable than those from large families, as pointed out by English[91] (1961).

Lasko, Koch, Johnson and Medinnus have commented on the first-born child. Lasko[92] (1954) said that the mothers behave less warmly, and are more restrictive and coercive, towards their first child than towards their second. Moreover, they protect the second child more than the first. Generally there seems to

be less parent-child interaction among first-borns. Koch[93] (1956) reported that the first-child was generally judged to recover less readily from emotional upsets and anger. The middle child was more suggestible and social, while the youngest child seemed to be most concerned about establishing his individuality within the family. Johnson and Medinnus[94] (1965) pointed out that the first child, upon the birth of a sibling, must adjust to a change in the quality of his interaction and relationship with parents. The second child, on the other hand, enjoys a greater stability of parental treatment. It is significant that all the above investigators seem to agree very well on the essentials of this issue.

Regarding adolescents and their problems, Stott[95] (1950) took the view that juvenile delinquency is an escape from an emotional situation which is too much for the child, such as domestic disharmony, parental ill health, lack of feeling of security, and emotional estrangement from parents. In the same year, Cooper[96] added that inadequate affection in the home and differences between the parents concerning the social, emotional, and moral development of their children are the conditions most likely to lead to delinquency. Many writers, including Horrocks, Rosen, Sherif, Bandura, and Campbell, have discussed the influence of the family on adolescents. Horrocks[97] (1954) noted that for adolescents, the home represents the ultimate and definitive repository of adult authority. However, Rosen[98] (1955) stated that more often than not, in cases where parent-peer groups have conflicting attitudes, adolescents tended to agree with their peers rather than their parents. Sherif and Sherif[99] (1956) viewed the position as follows:

> "Conflict situations arise when practices and values sanctioned by the family and those sanctioned by the adolescent's peer group on the same issues pull in opposite directions. The relative strengths of the reference groups will determine which alternative will be followed."

Bandura and Walters[100] (1959) attributed the development of aggressive behaviour in adolescents to the failure to satisfy the child's needs for dependency in early years. Campbell[101] (1969) concluded that ties between parents and children remain close throughout adolescence; the positive orientation toward parents does not diminish, and may indeed increase, during this period. Glueck and Glueck[102] (1950) found that the less use of physical punishment in childhood and the more reasoning, the less likely is the child or adolescent to engage in delinquent behaviour.

Vernon[103] (1969), summarizing other studies, agreed that socialization practices and the home 'climate' are most influential during the preschool and early school years. The democratic but demanding home climate encourages better intellectual progress than the over-protected, the autocratic or the unconcerned homes. Based on the results of his own study, Miller[104] (1967) also suggested that though the long-established relationship between social class and academic achievement was confirmed, the importance of social class as an influential variable should now receive less emphasis from sociologists, psychologists and social workers than in the past. He suggested that more attention instead should be given to social-psychological variables which are common to, and cut across social classes. Bloom[105] (1964) also emphasized that parental interest and encouragement are more important factors in development than the material circumstances of the home. The present study follows this line of thought.

An important issue is how the psychological home environment

should be investigated and careful enquiry reveals that the following authors have given their opinions on this issue. Ausubel et al.[106] (1954) pointed out that although parent behaviour is an objective event in the real world, it affects the child's ego development only to the extent and in the form in which he perceives it. Hence, perceived parent behaviour is in reality a more direct, relevant and proximate determinant of personality development than the actual stimulus context to which it refers. Sanford[107] (1956) remarked that discipline which is strict and rigid and, from the child's point of view unjust or unreasonable, may be submitted to, but it will not be genuinely accepted, in the sense that the child will eventually apply it to himself in the absence of external figures of authority. Jersild[108] (1960) stated that to understand the meaning of the parent-child relationship, we need to ask not only what the parents do and what they intend, but how the child perceives the situation. The child's view may be very different from what the parents have in mind. Lastly, in 1961, Meyer and Penfold[109] asserted that children's beliefs about their parents' interests mattered more than the actual interests and this meant that children tend to model themselves on their parents as they see them. The present research adopts this point of view.

3. Researches Directly Related to the Present Study

There have been several specific studies in many parts of the world which are of particular importance since their approaches and findings are clearly relevant to the aims of the present study. The following review may not be complete, but it is believed that it includes most of the essential literature.

Werner[110] (1969) reported from his longitudinal study of a sample of 485 children on the island of Kauai in Hawaii that

ratings of educational stimulation in the home yielded higher correlations with IQ's of both boys and girls than measures of parental ability, socio-economic status, and emotional support. In 1966, Ferguson and Maccoby[111] explored the interpersonal correlates of differential patterns of cognitive ability. They studied 126 students (about one-tenth of the student population) and assessed discrepancies between verbal, space, and numerical abilities. Inter-personal characteristics were assessed by self-report questionnaires and peer ratings. It was found that high verbal ability was associated with continued and somewhat conflicting dependency on adults and lowered social interaction with peers, whereas high numerical ability was related to assertiveness, interpersonal competence, and a more appropriate level of dependency. High space ability, when associated with low verbal or numerical skills, was related to sex-inappropriate patterns of behaviour, i.e., passivity in boys and aggressiveness in girls.

Honzik[112] (1967) focussed his study on the relation of the early family setting to mental growth from 21 months to 30 years. Family variables were rated on the basis of parental interviews and observations. Test performance showed increasing correlations with evidences of parental ability, maternal concern, energy, and worrisomeness, and the concern of both parents with achievement. It was also reported that the son's IQ was highly correlated with a close mother-son relationship and with the father's occupational success and satisfaction, and the daughter's test performance was positively related to father's friendliness to his daughter and to parental compatibility. These findings suggest a marked sex difference in the relevant affectional milieu as well as the importance of able, concerned parents and an activating mother to accelerated cognitive development. On the other hand, Baer

and Ragosta[113] (1966), in their determination of the relationship between perceived child-rearing practices and verbal and mathematical ability of 104 male and 100 female college students, found that males with less-loving and less-attentive fathers and less-loving mothers tend to have higher verbal ability than do other males. However, no relationship was found between mathematical ability and perceived parental behaviour for either sex.

Freeberg and Payne[114] (1967) summarised literature dealing with child-rearing practices that influence cognitive development. They pointed out three main trends in the literature:

(1) studies that attempt to relate measures of the child's cognitive ability to particular parental rearing practices,

(2) rearing practices characteristic of various social class levels as related to cognitive performance of children from those social classes, and

(3) experimental attempts to enhance cognitive skills in the very young child by specialized training techniques.

Despite increasing interest in this area, systematic research concerned with specific rearing practices as they affect particular cognitive skills is only beginning to become available. Freeberg and Payne concluded from their review that children of superior intellectual ability come from homes where parental interest in intellectual development is evidenced by pressures to succeed and assistance in doing so, particularly in the development of the child's verbal skills.

Turning to the important problem areas under review , it should be noted that Freeberg and Payne further recognised that the controversial issue requiring clarification is the social-psychological home environment and its effects on the intellectual performances of the child. No conclusive answer has been arrived

as to whether the acceptant-democratic-indulgent, the authoritarian-restrictive, the dominant-ignoring, or the permissive home is more intellectually stimulating. The systematic comparison of various investigational findings has proved particularly difficult because of differences in the techniques employed and also between the variables chosen. Eells et al.[115] (1951) attempted to explain variations in intellectual skill among social strata, based on the argument that intelligence tests, in general, favour children from middle and upper social classes. Though some culture-fair or culture-free tests have been constructed to overcome the unfair advantage, they do not solve the problems resulting from poor early learning environments, since children of lower social class may also be handicapped in all sorts of other ways on such tests. On the other hand, such tests show many of them to possess good potential ability, which they will be unable to realise at school because of home disadvantages. Freeberg and Payne pointed out that the direction of recent research into parental influences on the child's acquisition of cognitive skills has begun to expand beyond the rather vague concepts of 'enriched experience' and 'widening of interests'. It is largely over the past decade that various aspects of parent-child interaction have been investigated in an attempt to define their influence upon specific modes of cognitive responses. The present study accordingly directs its attention specifically to this area of interest.

Other studies relevant to the present theme include those of Caplin, Harrison, Stayton et al., Carlson, Heilburn and Orr, Baumrind, Tyler et al., and Hetherington. Caplin[116] (1969) matched 60 children from the intermediate grades of the elementary schools in a small city in northern New Jersey on the basis of age, grade, sex, race, intelligence, and socio-economic status, and found from

a self-report instrument that children (both white and Negro) attending the de facto segregated schools had less positive self-concepts than did children attending desegregated schools. Harrison[117] (1969) attempted to determine the extent of the relationship of real and ideal educational and occupational aspirations to school performance and to socio-economic status, and found that middle-class students and successful students expected and desired more education and a higher occupational status than lower-class students and unsuccessful students, and that the ideal educational aspirations of males were higher than those of females. Stayton et al.[118] (1968) observed social interaction, including both affectionate and aggressive behaviour, in a group of institutionalized retarded children, and found that social interaction, affection, and aggression had significant positive correlations with length of time at home prior to institutionalization. However, when partial correlations were calculated, holding the variables of CA, MA, and IQ constant, only the factor of aggression was found to be still significantly correlated with length of time at home. Aggression was observed much less often than was affectionate behaviour.

Carlson[119] (1965) made a longitudinal study of changes in the structure of the self-image among high school students. His questionnaire provided measure of self-esteem and social-personal orientation. Over a period of six years, he showed that girls increased in social orientation while boys increased in personal orientation, reflecting the different processes of personality development for adolescent boys and girls. However, self-esteem was shown to be independent of sex. Heilbrun et al.[120] (1966) attempted to test whether perceived patterns of maternal control and nurturance would relate to the normal son's goal-setting

behaviour under failure conditions. His subjects were 61 college male students. He discovered that those students who rated their mothers as 'rejecting' were less stable and less positive in their levels-of-aspiration on a discrimination task, and less stable in their betting on a gambling task, than students rating their mothers as 'accepting'. It was proposed as an explanatory hypothesis that failure influenced goal-setting in the 'rejected' group more than it did in the 'accepted' group because of lower self-esteem generated by their child-rearing history.

In 1966, Baumrind[121] contrasted three models of parental control -- permissive, authoritarian, and authoritative. He described permissive control as an attempt to behave in a non-punitive, acceptant, and affirmative manner toward the child's impulses, desires, and actions; authoritarian control as an attempt to shape, control, and evaluate the behaviour and attitudes of the child in accordance with a set standard of conduct, usually an absolute standard, formulated by a higher authority; and authoritative control as an attempt to direct the child'd activities in a rational, issue-oriented manner. He reviewed the pertinent findings of the effects of disciplinary practices on child behaviour and examined the relation between freedom and control. Finally he concluded that authoritative control may effectively generate in the child behaviour which, while well socialized, is also wilful and independent. A year later, Baumrind[122] found that parents of the most competent and mature boys and girls were notably firm, loving, demanding, and understanding, while parents of dysphoric and disaffiliative children were firm, punitive, and unaffectionate. Also, mothers of dependent and immature children lacked control and were moderately loving, while fathers of these children were ambivalent and lax.

Heilbrun et al.[123] (1967) investigated the achievement motivation of groups of college students who differed in the child-rearing patterns attributed to their mothers. It was found that students who perceived their mothers as more controlling were differentially influenced in their achievement goals as a function of perceived maternal nurturance, whereas no effect of nurturance was found for low-control students. High-controlled and low-nurturance ('rejected') students were more conservative in their goals than high-controlled and high-nurturance ('overprotected') students. This effect was more pronounced for female students than for males.

Tyler et al.[124] (1966) tested the following three hypotheses in their study:

(1) existence of relationships between motivations of a parent in child-rearing and motivations of his child;

(2) motivations of the child more closely related to those of mother than father;

(3) motivations of the child better predicted from composite score of maternal and paternal motivations than from either score alone.

Three samples of college students from a faculty housing project were used. Need Value and Expectancy scores for the motivational categories of Recognition-Status, Love and Affection, and Dominance were obtained for each parent in an open-ended interview, and their children were observed and assessed during regular pre-school activities. Children's scores were also obtained for the categories of Independence and Protection-Dependency. It was found that parent-child patterns were low in magnitude and quite variable from sample to sample. However, combining samples and regrouping on the basis of age and sex of students led to acceptance

of some aspects of the first hypothesis and rejection of the other two hypotheses.

Hetherington et al.[125] (1967) explored the relationship of parental dominance, warmth, and conflict to the imitation of parents by boys and girls. The subjects were 80 male and 80 female nursery-school and kindergarten children and their parents. The results indicated that parental warmth and dominance are related to identification; however, parental dominance was found to be more important for imitation by boys while maternal warmth was found to be more effective with girls. Hetherington et al. interpreted their data as indicating support for identification with the aggressor under conditions of a high-conflict home where both parents are low in warmth. The present research also intends to explore the relation of different home atmospheres to the psychological traits of both boys and girls.

A recent study of language development in two groups of socially disadvantaged young children was made by Schwartz and Deutsch[126] (1967), and their findings support the hypothesis that early enrichment helps to offset language disability arising from socially disadvantaged conditions. Brody[127] (1965) studied the relationship between maternal attitudes and behaviour. He administered the Parental Attitude Research Instrument (PARI) and the Maryland Parent Attitude Survey (MPAS) to 50 mothers of preschool children. The subjects were then dichotomized into high and low groups on the basis of Authoritarian, Hostility-Rejection, and Democratic factors of the PARI, and on the Disciplinarian and Rejecting scales of the MPAS. Then the high and low attitude groups were compared on scores of maternal behaviour, determined by observing individual mother-child interaction sessions in an experimental play setting. High and low attitude groups differed

significantly as hypothesized on non-attention, directing, restriction, forbidding, verbal interaction, interactive play, and rate of compliance. There were no significant differences between groups with regard to attentive observation, responsiveness to questions, helping, criticism, appraise-approval-affection, teaches-explains-demonstrates, questions, and structuring.

The contribution and influence of Schaefer are among the most important in this field. In 1965, Schaefer[128] developed a set of scales designed to collect children's reports of parental behaviour; the Child's Report of Parent Behavior Inventory (CR-PRI). Twenty-six concepts such as ignoring, possessiveness, and lax discipline were selected that were hypothesized to sample all sectors of a conceptual model for parental behaviour. A 10-item scale was developed for each concept from items that describe specific observable behaviours. Internal-consistency reliabilities of the scales are reported for normal boys, normal girls, and delinquent boys. The discriminative power of the scales is demonstrated by an analysis of differences between normal and delinquent boys. In 1968, Renson, Schaefer et al.[129] administered an adapted and translated version of the CR-PBI to 182 Walloon (French-speaking Beligian) high school students. Academic and vocational schools were chosen to ensure a wide range of socio-economic status for the samples of 96 boys and 86 girls. The revised CR-PBI includes 18 scales of either 8 or 16 items each. The items are descriptions of concrete, specific, easily observable behaviours. The subject indicates whether the items is "Like", "Somewhat Like", or "Not Like" his parent's behaviour on separate but identical forms for father and mother. A factor analysis of the intercorrelations of the 18 scales revealed three factors -- Acceptance versus Rejection, Psychological Control, and Lax Control

versus Firm Control -- that were similar for boys and girls, for reports of fathers and mothers, and for American and Walloon subjects. A spherical map of parent-behaviour concepts was generated by stereographic projections of each scale's factor loadings. The findings provide evidence of the cross-national validity of a spherical conceptual model for parent behaviour. It was believed that if further studies in other cultures were to reveal dimensions of parent behaviour similar to the American and French-Belgian findings, then a single configurational model for parent behaviour and a cross-culturally valid psychology of parent-child relations might be developed.

Ginsburg, McGinn and Harburg[130] (1970) did a similar study of the recalled parent-child interaction of United States and Mexican males. They recognised that to get information about parent-child interaction from parents has two obvious disadvantages: First, although parents can describe their own actions and intentions more precisely, they cannot describe their child's perception of those actions. Second, parents are often biassed informants, and if we are interested in the child's perception of parent-child interaction, it seems unwise to introduce additional and unnecessary sources of error by inferring the child's world from parental reports, which are only indirect measure of the child's concepts. They felt that the emotional connotations of internalized interaction patterns of the child are important variables in parent-child relations, which could be measured through an appropriately designed semantic differential. Hence, they developed the Parent Image Differential (PID) Test in an attempt to measure more directly the parent-child interaction as experienced by the child. The above view is basically accepted in the present study. It is believed that the way the child views his parents is more revealing

and reliable than parents' assessment of their own treatment of children, and that perceptions formed in childhood will continue to exist through adolescence. Hence the PID Test was considered a suitable and useful instrument for investigating recalled parent-child interaction (psychological home environment) and for identifying different parental behaviours for analyses in this present research. A detailed description of the PID Test and its related findings is given in Chapter Four.

4. Chronological Summary of Research Literature Leading to the Present Study

For ease of reference, the literature reviewed in this chapter is summarised in chronological order below in two basic categories, namely cognitive and affective aspects:

(a) Cognitive Aspects

Date	Author	Country	Cognitive Aspects
1923	Gordon	Britain	Canal boat children inferior in intellectual ability.
1925	Gaw	Britain	Underprivileged children deficient in more verbal ability.
1932, 1942	Wheeler	U.S.A.	Economic and educational conditions boost intelligence test scores.
1934	Cattell	Britain	Confirmed relationship between parental occupation and child intelligence.
1937	Burt	Britain	Low social class associated with backwardness in school.
1942	McNemar	U.S.A.	The mean IQ's of children of professional fathers appreciably higher.
1943	Fleming	Britain	Positive correlation between socio-economic status and test performance.
1943	Goldfarb	U.S.A.	Institution-reared orphans were more retarded intellectually and had language and speech difficulties.
1945	Havighurst, Janke	U.S.A.	Children of families of higher socio-economic status tended to do better in all tests of ability.
1945, 1949	Baldwin, et al.	U.S.A.	Democratic home atmosphere is more conducive to intellectual growth than other types.
1947	Vernon	Britain	Significant differences in the variation of intelligence with occupation, age, and locality of residence.
1949	Hebb	Canada	Intelligence B (present mental efficiency) results from interaction with environment.
1950	Piaget	Switzerland	Intellectual operations are acquired by interaction between organism and environment in a lawful sequence.
1950	Seashore, et al.	U.S.A.	The mean I.Q.'s for children of professional and semiprofessional men were higher.
1951	Campbell	Britain	Cultural level of the home affects appreciably educational attainment.
1951	Eells, et al.	U.S.A.	Very clearcut relationship between social status and measured intelligence especially verbal ability.
1956	Arvidson	Britain	Home environment influences verbal achievement more than numerical.
1957	Kent, Davis	Britain	Maternal discipline is associated with test performance.

Date	Author	Country	Cognitive Aspects
1957	Porter	Britain	Parental interest played a highly significant role in the child's academic achievement.
1958	Anastasi	U.S.A.	There is a difference between the mean IQ's of the children of professional men and those of the children of unskilled labourers. Correlations of intelligence with social status are higher in those abilities (in particular verbal) that tend to be favoured by a superior social environment. Bilingualism per se need not handicap a child.
1958, 1959	Bernstein	Britain	Verbal ability was significantly poorer for the working class group.
1959	Fraser	Britain	Very high relationship between intelligence and home environment. The child who is well equipped verbally is able to score highly on an intelligence test.
1960	Jersild	U.S.A.	Children of higher socio-economic status have a higher average level of intelligence.
1960	Vernon	Britain	Children from middle class tend to show better vocabulary.
1962	Havighurst	U.S.A.	Children of high social class tend to have higher intelligence test scores.
1963	Cattell	U.S.A.	Crystallized intelligence results from cultural pressures, education and experience.
1963	Mussen	U.S.A.	Motivation, personality structure, language ability, and social-psychological environment all contribute significantly to intelligence.
1963	Ravenette	Britain	The verbal scores of working class children are significantly lower than perceptual scores, and the situation is more clearly marked for girls than for boys.
1964	Douglas	Britain	Children of encouraging parents do better in all tests: picture intelligence, reading-comprehension and arithmetic.
1964	Reid	Jamaica	Home is almost solely responsible at preschool stage for providing a sufficiently enriched and stimulating environment for the child's mental growth and educational development.
1965, 1966, 1967, 1969	Vernon	Britain	The most important environmental factor contributing to children's performance on 'g' and verbal tests is the cultural level of the home, parental education and encouragement, while the most important factor in the home situation is the purposefulness and rationality of the family atmosphere.

Date	Author	Country	Cognitive Aspects
1966	Ferguson, Maccoby	U.S.A.	Discrepant verbal ability was associated with continued and somewhat conflicting dependency on adults and lowered social interaction with peers. Numerical ability was related to assertiveness and interpersonal competence. High space ability was related to sex-inappropriate patterns of behaviour.
1967	Freeberg, Payne	U.S.A.	Children of superior intellectual ability come from homes where parental interest in their intellectual development is evidenced.
1967	Schwartz, Deutsch	U.S.A.	Early enrichment helped to offset language disability related to socially disadvantaged conditions.
1967	Stott	U.S.A.	The mode of verbal communication between a mother and her preschool child is vitally important to the development of the latter's cognitive structure.
1967	Wiseman	Britain	Socio-economic class and its associated conditions of child care still make substantial differences to children's intelligence and achievement.
1967	Honzik	U.S.A.	There is a marked sex difference in the parental affectional milieu relevant to accelerated cognitive development.
1969	Thom	Guyana	The selection test scores (arithmetic, English, non-verbal and verbal intelligence) are affected by the parental, socio-economic and environmental background.
1969	Werner	U.S.A.	Educational stimulation in the home has greater relationship with IQ's of both sons and daughters than measures of parental ability and socio-economic status.

(b)**Affective Aspects**

Date	Author	Country	Affective Aspects
1921, 1923, 1933, 1940	Freud	Germany	Parents are the child's first model to be identified with.
1934	Mead	U.S.A.	Two types of conduct in the parent-child relationship were identified: the imitation of the child, and the sympathetic response of the parent.
1939	Symonds	U.S.A.	Acceptance and autonomy are two significant considerations in the home.
1940	Groves	U.S.A.	Parental acceptance and affection determine the psychological atmosphere surrounding the child.
1943	Berdie	U.S.A.	The income and occupational status of fathers seemed to govern, to some extent, the interests of the sons.
1943	Goldfarb	U.S.A.	Severe deprivation of early environment resulted in social and emotional maladjustment, persisting into adolescance.
1945, 1949	Baldwin, et al.	U.S.A.	Warmth is the most crucial and persuasive factor affecting the child.
1945	Goldfarb	U.S.A.	Children who were institutionalized in infancy and who did not experience consistent 'mothering' became apathetic and socially unresponsive.
1948	Bossard	U.S.A.	The development of personality is in large part the result of family conditioning.
1948	Frank	U.S.A.	The family is the essential agency for the socialization of the young child.
1949	Stern	France	Lack of parental identification hindered the normal development of the superego.
1950	Allport	U.S.A.	Children and youth need warm affectionate relationships.
1950	Cooper	U.S.A.	Inadequate affection in the home and differences between parents concerning the social, emotional, and moral development of their children are the conditions most likely to lead to delinquency.
1950	Glueck, Glueck	U.S.A.	The less use of physical punishment in childhood and the more reasoning resulted in a child or adolescent who was less likely to engage in delinquent behaviour.
1950	Liu	U.S.A.	Close and affectionate family ties among Chinese help to provide security and freedom from apprehension for the child and youth.
1952, 1960	Jersild	U.S.A.	The home is very important in the development of the child's self concept.
1952	Havighurst	U.S.A.	Consistency of discipline is positively related to the development of ethical competence.

Date	Author	Country	Affective Aspects
1954	Horrocks	U.S.A.	The effect of home upon adolescents is very great.
1954	Jones	U.S.A.	The most important environmental factor is the home.
1954	Miles	U.S.A.	Shared family experience is important in development of family interests.
1955	Maas	Britain	Middle-class fathers were more concerned about social status and had higher educational and vocational aspirations.
1955	Newcomb	Britain	The family is the most important primary group in the development of attitudes.
1957	Marshall, McCandless	U.S.A.	Consistent negative correlations between children's popularity with peers and their dependency on adults.
1957	Sears, et al.	U.S.A.	The most significant aspect of the home is the warmth of the relationship between parent and child. Mothers are more effective than fathers.
1958	Lovell, White	Britain	Students choosing to study science were significantly more likely to have fathers who had scientific interests.
1959, 1963	Bandura	U.S.A.	Parents of aggressive preadolescents and adolescents use physical punishment more frequently and reasoning less frequently than the parents of non-aggressive children. Aggressive behaviour in adolescents is due to the failure to satisfy the child's needs for dependency in early years.
1959	Becker, et al.	U.S.A.	Authoritarian and arbitrary maternal attitudes were correlated with the presence of conduct problems in children.
1959	Fraser	Britain	A favourable environment is likely to encourage the child to develop interests similar to the parents'.
1959	Meyer	Britain	Attitudinal relations between parents and child influence science interest.
1960	Erikson	U.S.A.	The early interactions between a mother and her infant lay the ground-work for the child's development.
1960	Jayasuriya	Britain	Middle-class grammar school children had higher achievement motivation.
1961	English	U.S.A.	Children from small families are more frequently acceptable to peers than those from large families.
1961	Medinnus	U.S.A.	Lack of parental acceptance seemed to constitute an important factor in poor adjustment.
1963	Mussen	U.S.A.	Parental motivation is significantly related to a student's aspiration level.
1964	Swift	U.S.A.	Parental treatment is of overriding importance in determining the child's perception of himself.

Date	Author	Country	Affective Aspects
1965	Dinkmeyer	U.S.A.	The parents provide the child with his first social interaction. Their attitudes toward learning and academic discipline serve as a model for him to accept or reject. Children who are raised in a less authoritarian atmosphere in which there is consistency and acceptance tend to be more open to others, friendlier, and able to respond in their relationships with peers. Authoritarian and extreme parental controls are detrimental to the social development of the child. Children from autocratic homes are more frequently rated as unpopular with classmates.
1965	Evans	Britain	Environmental influences play an important part in determining the interests which an individual develops. Most children develop attitudes resembling those of other members of the family.
1965	Johnson, Medinnus	U.S.A.	Differences in maternal attitudes and behaviour could produce distinctions in the personalities of children.
1965	Rosenberg	U.S.A.	Parental behaviour is related to the child's self-esteem.
1965	Stewart, Warnath	U.S.A.	Internalization of parental values helps the child to become independent.
1966	Heilbrun	U.S.A.	Students of rejecting mothers were less stable and less positive in their levels of aspiration.
1966	Toch	Britain	Parents inculcate in their children an infinite number of perceptions, attitudes, and beliefs.
1967	Baumrind	U.S.A.	Parents of the most competent and mature boys and girls were notably firm, loving, demanding, and understanding.
1967	Cooper-smith	U.S.A.	Mother of high self-esteem children were more likely to enforce established rules carefully and consistently.
1967	Hetherington	U.S.A.	Parental warmth and dominance were related to identification, parental dominance being more important for boys and maternal warmth for girls.
1968	Entwistle	Britain	Academic motivation must take account of both temperamental traits and environmental variables.
1968	Moore	U.S.A.	The family provides for initial social placement and early socialization of the young.
1969	Campbell	U.S.A.	Parents and parent-child relationships both have an important influence on the adolescent.
1969	Harrison	U.S.A.	Middle-class students and successful students expected and desired more education and a higher occupational status. The ideal educational aspirations of males were higher than those of females.

5. Summary of Review in Terms of Present Research

Summing up the main findings of the literature in this field, as surveyed in the present chapter, it would appear that the relation of parent-child interaction in its broad meaning and certain psychological attributes -- such as intellectual abilities, particularly verbal ability, attitude towards home, social interest, academic motivation, popularity, as well as achievements -- is worth investigating in some detail. It may be reasonably expected, in view of the state of our present knowledge in this field that the results of this present research will throw some light on the main theme of this study as well as helping us to a better understanding of the various related issues and special aspects of this theme as discussed in this chapter. It may be thought likely that early childhood home experiences would show their effects more markedly in the adolescent years, since the evidence suggests that such experience does not show persistent effects at the adult stage when other factors tend to become more influential determinants of sophisticated and mature adult-level behaviour. Hence the focus of the present investigation will be on the adolescent period and be concerned with the above aspects of the subject.

In Hong Kong, a systematic research such as that proposed here has not previously been carried out. It would therefore be of very special interest and of some wider research significance to discover to what extent the Hong Kong findings of this study match up to or contrast with those reviewed in this present chapter. Moreover, in view of the ever-changing socio-economic and cultural scene in Hong Kong, this investigation seems likely to be particularly important in this crucial period of educational innovation when the Hong Kong government is contemplating universal

and compulsory education and a far-reaching curriculum revision. Not only the general state of our knowledge in this area, but also the above special Hong Kong circumstances appear to point to the need at this time for carrying through a research of the type suggested here. The next chapter provides more detail of the research itself and specific hypotheses will be formulated based on the findings in the research literature reviewed in this chapter.

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CHAPTER THREE

FORMULATION AND HYPOTHESES

1. General Considerations

In the development of the child, three main socialisation processes can usually be identified, namely interactions in the family, school, and society. The socialisation process in the family begins at birth and develops steadily early in life, and (modern social psychology teaches us) has a basic and primary effect on the child's development. Later school and society supplement and modify this process in various ways and contribute what may be termed secondary characteristics only to the child's development.

It would appear, then, that most children are likely to acquire many if not all of their more fundamental attitudes in the homes in which they are brought up. Parents provide examples which are constantly before their children. As pointed out in Chapter Two, the child's basic social attitudes to others largely depend on the attitudes he develops to parents and siblings in the home. Parental interests, opinions, prejudices and the like are often picked up by the children in all sorts of ways, by direct imitation and even more often unconsciously, and homes with certain facilities will generally help children develop particular interests and points of view. It has been reported also that significant relations are found between parental and children's academic motivation. As children's intelligence scores may be related, in part, to their desire to improve their knowledge and problem-solving skills, family experiences which encourage the development of this desire are likely normally to lead to high intelligence scores, stronger motivation for intellectual mastery, and hence better achievement generally.

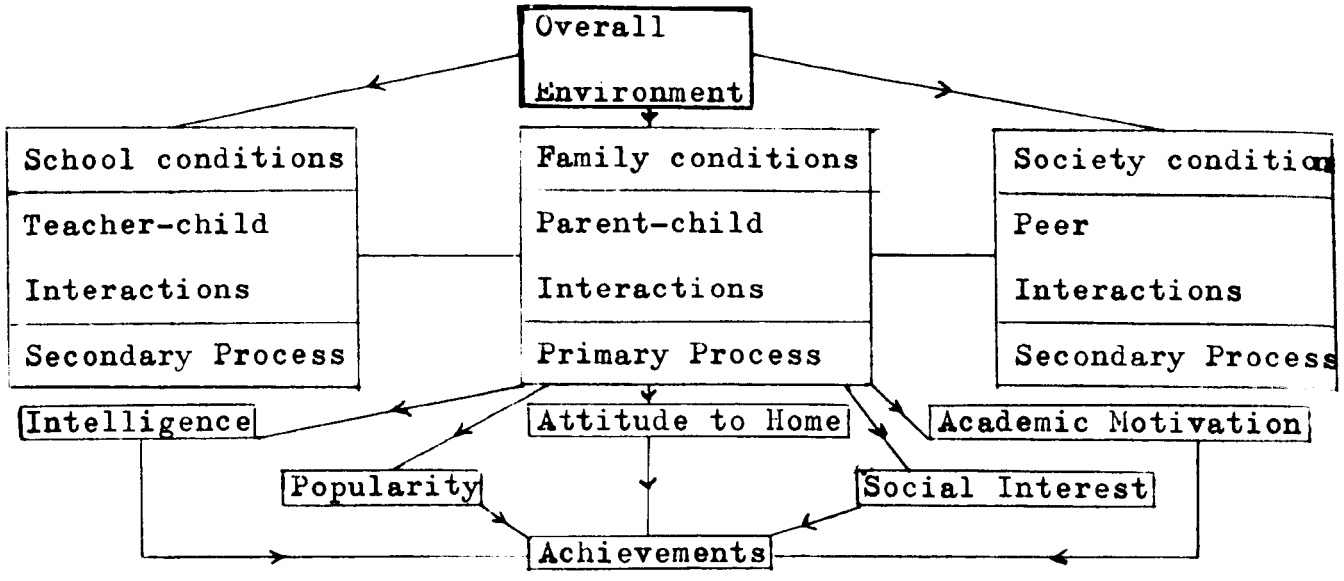
The present study proposes to investigate in some detail the psychological aspects of the home environment taking Hong Kong in particular as the example because here significant family emphases stand out. In view of the above considerations, the current study would appear to be a well-founded area, well worth investigating. It is suggested in particular that the effect of the parent-child interaction on the intellectual and emotional development of Chinese students aged approximately 17 in Hong Kong should be investigated with the above background considerations in mind. Since Hong Kong is a Westernised society and there are great variations in the economic background of the families, it is desirable and rather important for present purposes that the study should take account of traditional Chinese customs and modern Western influences on the family, as well as the socio-economic and environmental factors. It should be noted, furthermore, that not all children in Hong Kong attend school, and for socio-economic reasons, secondary education is neither free nor compulsory. However a measure of free primary education was introduced recently and parents have to show cause why they do not send their children to school, though cases have yet to be put to the test in a court of law. In addition, the primary schools of Hong Kong commonly have two sessions -- an "AM" and a "PM" session, as also do quite a number of secondary schools -- thus Hong Kong children even if they attend school may be home half the day -- and much more so than their Western counterparts. In the home, the children's homework may be supervised, or in the session "at home", the children are expected "to work" and "to study". This situation, which sees many children more at home than at school, together with the foregoing factors, makes the family even more important in the child's development in Hong Kong

than in many other places.

The main purpose of this project is therefore to identify the significant family background factors most likely to contribute to the intellectual and emotional status of the 17-year age group in Hong Kong. It is also intended to attempt to estimate the relative effect of parental influence on various aspects of psychological development. Whilst it is not easy to educate the parents nor to change established social patterns, much may be done in the schools where the teachers can exert their influence in changing the students' attitudes and interests, developing motivation, and stimulating intellectual development. Also it is recognized that school facilities and extra-curricular activities may well be developed so as to compensate to some extent for deficiencies in the deprived home. It is hoped that the present study will contribute to this end.

To give a clearer picture of the focus of the proposed enquiry, and gather up the foregoing psycho-educational considerations, there is set out below a notional model of socialisation processes in the child's intellectual and emotional development.

M.1: CONJECTURED MODEL OF SOCIALISATION PROCESSES IN THE CHILD'S INTELLECTUAL AND EMOTIONAL DEVELOPMENT



The above model is simply an attempt to outline all the theoretical social processes and traditional community influences which may be expected to help determine the growing child's intellectual and emotional developments. The present investigation proposes to concentrate on those conditions which are restricted to the family.

The basic socialisation process in the family is no doubt the parent-child interaction, while later there are the teacher-child and peer interactions. Parent-child relationships have been reported by various research workers to have important bearings on the intellectual and emotional (i.e. the cognitive and affective) development of the child. It is believed that parental influence has a particular and rather specialized relevance to adolescents who are on the road to becoming adults, and perhaps even more so in the somewhat traditional Chinese household. During the change-over critical period from child to adult, the effect of the adolescents' early experience in parental care, support, encouragement, and warmth of the home is expected

to show itself more prominently in their intelligence, and also in their various abilities, and in items like attitude to home, their social interest, academic motivation, popularity, and achievements. Thus we may assume that parents play an important role in directing the child to become a responsible and all-round adult, and it is clearly worth investigating in this study the relation of parent-child interaction and psychological attributes at the crucial stage of development, namely adolescence. Furthermore, it has been pointed out in other studies that unfavourable parental treatment is a significant contributory factor in juvenile delinquency. This fact also has bearing on the present hypotheses.

Though intelligence has a significant component attributed to genetic factors, environment also plays a large part in its development to full capacity. Psychologists have reached a large measure of agreement that a favourable environment, including home circumstances, is essential to the child's intellectual growth. This is shown in the review of the literature set out in the preceding chapter. Based on the various research findings, it is also now clear that the parent-child relationship is a major determinant of the child's formation of attitudes. In the light of this position and further to the studies previously reviewed, the following hypotheses appear to be reasonable for the Hong Kong situation.

2. Specific Hypotheses

Turning to more specific aspects of the issue, we find that studies by Gaw (1925), Goldfarb (1943), Eells et al. (1951), Fraser (1959), Arvidson (1956), Bernstein (1959), Vernon (1960), Ravenette (1963), Douglas (1964), Schwartz and Deutsch (1967), and Thom (1969) show that severe deprivation in the early environment

results in deficiency of measured intelligence, especially in the areas of verbal ability, and that the home situation or family atmosphere is an important factor in the significant early environment of the children. Thus the above findings would appear to lead directly to the following hypothesis in terms of the Hong Kong situation:

H1. There is a significant relationship between parental behaviour and children's verbal ability.

Studies by Arvidson (1956), Douglas (1964), Ferguson and Maccoby (1966), and Thom (1969) further show that parental, socio-economic and environmental background has bearings on the numerical ability of the children, though a comparatively less important influence than on verbal ability. Thus the above findings suggest the following hypothesis for the Hong Kong situation:

H2. There is a significant relationship between parental behaviour and children's numerical ability.

Studies by Fraser (1959), Ravenette (1963), Douglas (1964), and Ferguson and Maccoby (1966) also show that home environment affects the scores on non-verbal ability tests, though significantly less than in the case of both verbal and numerical scores. Thus the following hypothesis for the Hong Kong situation seems reasonable:

H3. There is a significant relationship between parental behaviour and children's non-verbal ability.

All studies of children's cognitive development reviewed in Chapter Two and particularly those of Wheeler (1942), Goldfarb (1943), Baldwin et al. (1945), Cattell (1963), Mussen (1963), Douglas (1964), Reid (1964), Vernon (1965), Ferguson and Maccoby (1966), Freeberg and Payne (1967), Stott (1967), Thom (1969), and Werner (1969) reveal that the home is responsible for providing a sufficiently enriched and stimulating environment for the child's

mental growth, in particular at the preschool stage. It would appear that such findings suggest the following hypothesis for the Hong Kong situation:

H4. There is a significant relationship between parental behaviour and children's overall general intelligence.

Studies by Burt (1937), Fleming (1943), Campbell (1951), Kent and Davis (1957), Porter (1957), Wiseman (1967), and Thom (1969) indicate that home environment and particularly parental interest and discipline influence the academic achievement of children. These studies suggest the following hypothesis for the Kong Kong situation:

H5. There is a significant relationship between parental behaviour and children's achievements.

Studies by Ravenette (1963), Ferguson and Maccoby (1966) also indicate that there is a difference between girls and boys in verbal and other mental abilities. These studies in turn show that the following hypothesis for the Hong Kong situation is likely:

H6. There are significant differences between boys and girls in cognitive abilities.

Studies by Newcomb (1955), Dinkmeyer (1965), Evans (1965), Johnson and Medinnus (1965), and Toch (1966) show that the family plays a very important part in the development of children's attitudes. Thus the following hypothesis for the Hong Kong situation is suggested:

H7. There is a significant relationship between parental behaviour and the children's attitude toward home.

Studies by Berdie (1943), Goldfarb (1943), Miles (1954), Lovell and White (1958), Fraser (1959), Meyer (1959), and Evans (1965) show that environmental influences play an important part in determining the interests of the children. These particular findings seem to lead to the following hypothesis for the Hong Kong situation:

H8. There is a significant relationship between parental behaviour and the children's social interest.

Studies by Maas (1955), Jayasuriya (1960), Mussen (1963), Heilbrun (1967), Entwistle (1968), and Harrison (1969) show that parental motivation is significantly related to children's aspiration level. These studies indicate that the following hypothesis for the Hong Kong situation is possible:

H9. There is a significant relationship between parental behaviour and the children's academic motivation.

Studies by Goldfarb (1943), Frank (1948), Marshall and McCandless (1957), Bandura (1963), Dinkmeyer (1965), and Moore (1968) show that family is the essential agency for the socialization of the young child. Once again such findings suggest a particular hypothesis for the Hong Kong situation:

H10. There is a significant relationship between parental behaviour and the children's popularity.

Studies by Harrison (1969) and others indicate that the educational aspirations of males are higher than those of females. The above findings appear to lead to the following hypothesis for the Hong Kong situation:

H11. There are significant differences between boys and girls in such affective attributes as attitude to home, social interest, academic motivation, and popularity.

Studies by Sears et al. (1957), Becker et al. (1959), Erikson (1960), Johnson and Medinnus (1965) reveal that father and mother are different in their behaviour towards the child. The findings of these studies suggest the formulation of the following hypothesis for the Hong Kong situation:

H12. There are significant differences between paternal and maternal behaviour towards their children.

Studies by Gordon (1923), Wheeler (1932), Havighurst and Janke (1945), Vernon (1947), Eells et al. (1951), McNemar (1942),

Berdie (1943), Goldfarb (1943), Seashore et al. (1950), Jersild (1960), Ravenette (1963), Reid (1964), Douglas (1964), Wiseman (1967), Thom (1969), Harrison (1969), and others indicate that home environment has an important bearing on children's cognitive and affective growth. Finally, it would seem that the above findings suggest the following hypothesis for the Hong Kong situation where the schools located in different areas are generally attended by students having parents of a certain income group and particularly a certain educational level:

H12. <u>There are significant between-school differences for the various cognitive and affective attributes of children</u> .

This concludes the formulation of hypotheses for this research, and the next stage is to test these hypotheses by the use of a number of psychological tests.

CHAPTER FOUR

THE PARENT IMAGE DIFFERENTIAL TEST

1. Background of Research

Ginsburg et al.[1] (1970) developed the Parent Image Differential (PID) Test to obtain dimensions of recalled parent-child interaction from the viewpoint of the child. This test is designed to cover six concepts: Father Treated, Mother Treated, Father Taught, Mother Taught, Father Disciplined, and Mother Disciplined. There are 15 items (e.g., warm-cold) for Father Treated and Mother Treated, 14 items (e.g., often discussed things with me - rarely discussed things with me) for Father Taught and Mother Taught, and 15 items (e.g., often punished me-rarely punished me) for Father Disciplined and Mother Disciplined. The items for father and mother are identical throughout. The scales follow a semantic differential format (Appendix 1), e.g. ,

stern _____:_____:_____:_____:_____:_____:____ mild

skilful _____:_____:_____:_____:_____:_____:____ awkward

strict _____:_____:_____:_____:_____:_____:____ permissive

It was claimed that the concepts were conceived and arranged so as to have circumscribed location in time and to represent different categories of parent-child relations, and also to approximate both the linearity and bipolarity criteria suggested by Osgood et al.[2] (1957). "Immediate impressions" was emphasized in the instructions, and the students were requested to recall parent-child interaction from earliest memory to the age of about fourteen.

Ginsburg et al. applied the PID Test to a North American undergraduate group of introductory course psychology male students at the University of Michigan (n = 91; mean age = 19.4) and also to a group of male students at a college preparatory high

school in Mexico (n = 95; mean age = 17.6). The PID Test has also been administered to U.S. female college students, male U.S. college students with unusual blood pressure, their parents, U.S. teachers, Mexican high school females, and Bennington College students. The emphasis of the North American-Mexican study was on discovering stable factors across cultures. Moderate concurrent validity of the PID Test was claimed by Ginsburg. The principal axis technique and normalised varimax rotation were used to analyse the items for each concept, and test-retest reliabilities were calculated for the factor scores. The coefficients were considered satisfactory; one was as low as 0.48, but six were 0.75 or higher. A separate factor structure for each concept was obtained in each of the two groups and the stability of the factors across groups was assessed by comparing the items for each factor with loadings greater than 0.40. It was found that two factors: 'potency' in the concepts of Treated, Taught, Disciplined; and 'ambivalence' in the concept of Taught were stable. Ginsburg et al. explained that the 'potency' factor represents the severity, hardness, and immovability of the parent, while the 'ambivalence' factor represents the tendency of a parent to be awkward and uncertain in his relations with his child. They also pointed out that the 'potency' and 'ambivalence' factors were common to both father-child and mother-child relations, implying no functional differences in the father and mother roles as perceived by the child.

2. Preliminary Investigation

In the present study, the PID Test was tried out on a Hong Kong sample of 160 Chinese students aged 14.11 to 20.0, with mean age of 17.2. Factor analyses were carried out on the inter-correlation matrices for the six concepts. Principal components

method and varimax rotation were used as Ginsburg et al.[3] (1970) and Renson, Schaefer, et al.[4] (1968) did in their studies. Tables 12-17 in the next section were set up for comparison. It can be seen that most factors, particularly the first two factors for each concept among Chinese students, are similar to those obtained by Ginsburg in his study of American and Mexican students. This is to say that the factors are stable across cultures, though some are more so than others. Tables 7 and 8 (pp. 85 and 86) show that much the same items load highly on the various factors. The labels given by the present investigator to the factors may well be questioned on the grounds of subjectivity of interpretation, but most factors, and particularly the first two for each concept, are essentially the same, though with different names, for all three groups of students. This high similarity of factorial structure for Hong Kong, North American, and Mexican groups suggests that the PID Test is also suitable in the Hong Kong sample for studying recalled parent-child interaction. Li's[5] (1966) Hong Kong data also indicated that human beings share a common framework for differentiating the connotative or affective meanings of words, since studies in many cultural groups have yielded the same main dimensions of meaning as those general factors established by Osgood[6] (1955). These are the 'evaluation' factor (represented by items like good-bad, pleasant-unpleasant, kind-cruel, and positive-negative); the 'potency' factor (represented by items like strong-weak, large-small, heavy-light, and hard-soft); and the 'activity' factor (represented by items like fast-slow, active-passive, hot-cold, and excitable -calm), usually in that order. In view of these findings, it seems reasonable to use in the present investigation a semantic differential instrument such as Ginsburg's PID Test

for assessing independent parental variables to which other dependent psychological variables may be related.

Next the intercorrelation matrices of Hong Kong boys and girls were separately factor analysed and the factor patterns were compared to see whether similar factors emerged for boys and girls. There are various intricate methods for comparing factor patterns, e.g., Kaiser's coefficient of factor similarity (Kaiser[7], 1960), Joreskog's chi square (Joreskog[8], 1970), and Harman's coefficient of congruence (Harman[9], 1967). The first method was used by Ginsburg et al.[10] (1970); the second was recently developed at the Educational Testing Service (U.S.A.) and has not been much used as yet in the literature. The third method has been commonly employed in this type of study, e.g., Benson, Schaefer et al.[11] (1968). The present study adopted Harman's coefficient of congruence (epsilon) because of its simplicity in calculation, and also because it was considered that such coefficients suit the data of this study and are of sufficient accuracy for our present limited purposes. The coefficients are obtained by the use of the formula $\frac{\Sigma xy}{\sqrt{(\Sigma x^2)\ (\Sigma y^2)}}$, where x and y are the loadings of the two groups of factors under study.

The coefficients of congruence were found to be fairly high for most factors and particularly for the twelve important factors (the first two for each concept) which were found to range from 0.67 to 0.96 (five above 0.92, three above 0.84, two above 0.75, only one of 0.68 and one of 0.67) (Tables 9, 10, 11, pp. 87 to 89). The relatively high congruence of these factors provided considerable justification for calculating a single correlation matrix and hence a single factor analysis for combined boys' and girls'

recalled parent-child interaction for each concept. However, mean scores for father and mother concepts were found to differ significantly, and were therefore analysed separately below. From the following Tables 1-6 (pp.79-84) showing factors and loadings, it can be seen that the first two factors of each concept account for about half of the total variance (ranging from 41-51%). Hope[12] (1968) pointed out that if a satisfactory percentage of the total variance has been accounted for by the first few factors, it is a common practice to neglect the remainder. Hence it seems reasonable in the present study to use the first two factors for each concept; moreover the remaining factors in this case appear to be of very little importance, in terms of the data and purposes of this enquiry.

Table 1: FACTORS IN "FATHER TREATED"

FACTOR 1: (31% variance) (similar to Ginsburg's factor 3)

Item	Loading			
8	-0.84	INSENSITIVE	vs	sensitive
13	0.64	concerned	vs	INDIFFERENT
1	0.60	warm	vs	COLD
12	0.44	encouraging	vs	DISCOURAGING
15	0.42	close	vs	DISTANT

Label suggested: SENSIBILITY or CONCERNED *

FACTOR 2: (13% variance) (similar to Ginsburg's factor 2)

Item	Loading			
2	-0.81	STERN	vs	mild
4	-0.76	HARD	vs	soft
3	0.53	relaxed	vs	TENSE

Label suggested: SEVERITY or RESTRICTED*

FACTOR 3: (8% variance)

Item	Loading			
14	0.85	critical	vs	PRAISES
5	0.83	ridicules	vs	PRAISES
6	-0.50	LENIENT	vs	severe

Label suggested: AFFECTION or SYMPATHETIC

FACTOR 4: (7% variance)

Item	Loading			
10	0.77	punitive	vs	REASONABLE
7	-0.75	SKILFUL	vs	awkward
9	-0.71	JUST	vs	unjust

Label suggested: JUSTICE or REASONABLE

FACTOR 5: (6% variance)

Item	Loading			
11	0.79	consistent	vs	INCONSISTENT

Label suggested: CONSISTENT

Note: * Only the first two factors will be used, since they together contribute 44% of the total variance, and the other factors are of little importance.

Table 2: FACTORS IN "MOTHER TREATED"

FACTOR 1: (29% variance) (similar to Ginsburg's factor 4)

Item	Loading			
13	0.78	concerned	vs	INDIFFERENT
12	0.68	encouraging	vs	DISCOURAGING
15	0.66	close	vs	DISTANT
1	0.63	warm	vs	COLD
11	0.57	consistent	vs	INCONSISTENT
9	0.56	just	vs	UNJUST

Label suggested: SENSIBILITY or CONCERNED*

FACTOR 2: (12% variance) (similar to Ginsburg's factor 2)

Item	Loading			
4	-0.79	HARD	vs	soft
2	-0.73	STERN	vs	mild
6	0.46	lenient	vs	SEVERE

Label suggested: SEVERITY or RESTRICTED *

FACTOR 3: (9% variance)

Item	Loading			
8	0.83	insensitive	vs	SENSITIVE

Label suggested: SENSITIVITY

FACTOR 4: (7% variance)

Item	Loading			
5	-0.78	RIDICULES	vs	praises
14	-0.66	CRITICAL	vs	praises
7	0.61	skilful	vs	AWKWARD
10	-0.54	PUNITIVE	vs	reasonable

Label suggested: AFFECTION or SYMPATHETIC

FACTOR 5: (6% variance)

Item	Loading			
3	0.92	relaxed	vs	TENSE

Label suggested: LAXITY

Note: * Only the first two factors will be used, since they together contribute 41% of the total variance, and the other factors are of little importance.

Table 3: FACTORS IN "FATHER TAUGHT"

FACTOR 1: (31% variance) (similar to Ginsburg's factor 2)

Item	Loading			
1	-0.83	OFTEN DISCUSSED	vs	rarely discussed
4	-0.73	SKILFUL	vs	awkward
6	-0.693	TOGETHER	vs	rarely together
11	-0.690	UNDERSTOOD	vs	not understood
12	0.43	impatient	vs	PATIENT
2	0.40	discouraging	vs	ENCOURAGING

Label suggested: DEMOCRATIC *

FACTOR 2: (15% variance) (similar to Ginsburg's factor 3)

Item	Loading			
5	-0.87	STERN	vs	mild
9	0.82	soft	vs	HARD
10	-0.56	ALWAYS RIGHT	vs	admit wrong
13	-0.55	CRITICIZING	vs	praising

Label suggested: CONTROL or DEMANDING *

FACTOR 3: (9% variance)

Item	Loading			
7	0.82	easy to irritate	vs	DIFFICULT TO IRRITATE
8	0.80	tense	vs	RELAXED

Label suggested: IRRITABILITY or LAXITY

FACTOR 4: (7% variance)

Item	Loading			
3	-0.90	SUPPORTING	vs	criticizing

Label suggested: SUPPORT

FACTOR 5: (6% variance)

Item	Loading			
14	0.79	pleased on my own	vs	DISPLEASED

Label suggested: ENCOURAGING

Note: * Only the first two factors will be used, since they together contribute 46% of the total variance, and the other factors are of little importance.

Table 4: FACTORS IN "MOTHER TAUGHT"

FACTOR 1: (28% variance) (similar to Ginsburg's factor 2)

Item	Loading			
4	-0.81	SKILFUL	vs	awkward
1	-0.73	OFTEN DISCUSSED	vs	rarely discussed
6	-0.65	TOGETHER	vs	rarely together
11	-0.57	UNDERSTOOD	vs	not understood
10	0.46	always right	vs	ADMITS WRONG
2	0.41	discouraging	vs	ENCOURAGING

Label suggested: DEMOCRATIC *

FACTOR 2: (13% variance) (similar to Ginsburg's factor 4)

Item	Loading			
9	0.75	soft	vs	HARD
5	-0.73	STERN	vs	mild
12	-0.65	IMPATIENT	vs	patient
13	-0.58	CRITICIZING	vs	praising

Label suggested: CONTROL or DEMANDING*

FACTOR 3: (8% variance)

Item	Loading			
8	0.82	tense	vs	RELAXED
7	0.68	easy to irritate	vs	DIFFICULT TO IRRITATE

Label suggested: IRRITABILITY or LAXITY

FACTOR 4: (8% variance)

Item	Loading			
3	-0.91	SUPPORTING	vs	criticizing

Label suggested: SUPPORT

FACTOR 5: (7% variance)

Item	Loading			
14	0.88	pleased on my own	vs	DISPLEASED

Label suggested: ENCOURAGING

Note: * Only the first two factors will be used, since they together contribute 41% of the total variance, and the other factors are of little importance.

Table 5: FACTORS IN "FATHER DISCIPLINED"

FACTOR 1: (35% variance) (similar to Ginsburg's factor 1)

Item	Loading			
10	0.85	mild	vs	STERN
2	-0.81	HARD	vs	soft
6	0.78	lenient	vs	SEVERE
1	-0.77	PUNISHED OFTEN	vs	punished rarely
12	-0.71	STRICT	vs	permissive

Label suggested: PERMISSIVENESS/AUTHORITARIAN or AUTOCRATIC *

FACTOR 2: (16% variance) (similar to Ginsburg's factor 3)

Item	Loading			
4	0.77	persuasive	vs	ORDERED
11	0.75	reasonable	vs	UNREASONABLE
3	0.74	punishment explained	vs	PUNISHMENT NOT EXPLAINED
15	0.59	blame self	vs	BLAME HIM
8	0.58	guilty	vs	RESENT HIM
13	-0.43	RESIST HIM	vs	yield to him

Label suggested: JUSTICE or RATIONAL*

FACTOR 3: (7% variance)

Item	Loading			
9	0.93	do as he wishes	vs	KNOW THE RULES

Label suggested: DICTATORIAL

FACTOR 4: (7% variance)

Item	Loading			
5	0.77	angry when punishing	vs	CALM WHEN PUNISHING
7	0.75	easy to irritate	vs	HARD TO IRRITATE

Label suggested: IRRITABILITY

FACTOR 5: (6% variance)

Item	Loading			
14	0.79	wanted to run away	vs	BE WITH FAMILY

Label suggested: AFFECTION

Note: *Only the first two factors will be used, since they together contribute 51% of the total variance, and the other factors are of little importance.

Table 6: FACTORS IN "MOTHER DISCIPLINED"

FACTOR 1: (33% variance) (similar to Ginsburg's factor 2)

Item	Loading			
8	0.75	guilty	vs	RESENT HER
15	0.74	blame self	vs	BLAME HER
3	0.72	punishment explained	vs	PUNISHMENT NOT EXPLAINED
4	0.56	persuasive	vs	ORDERED
11	0.52	reasonable	vs	UNREASONABLE
13	-0.45	RESIST HER	vs	yield to her

Label suggested; JUSTICE or RATIONAL*

FACTOR 2: (13% variance) (similar to Ginsburg's factor 1)

Item	Loading			
6	-0.77	SEVERE	vs	lenient
1	0.75	punished rarely	vs	PUNISHED OFTEN
2	0.70	soft	vs	HARD
10	-0.69	STERN	vs	mild
12	0.66	permissive	vs	STRICT

Label suggested: PERMISSIVENESS/AUTHORITARIAN or AUTOCRATIC*

FACTOR 3: (8% variance)

Item	Loading			
7	0.823	easy to irritate	vs	HARD TO IRRITATE
5	0.822	angry when punishing	vs	CALM WHEN PUNISHING

Label suggested: IRRITABILITY

FACTOR 4: (7% variance)

Item	Loading			
9	-0.93	DO AS SHE WISHES	vs	know the rules

Label suggested: DICTATORIAL

FACTOR 5: (6% variance)

Item	Loading			
14	0.88	wanted to run away	vs	BE WITH FAMILY

Label suggested: AFFECTION

Note: *Only the first two factors will be used, since they together contribute 46% of the total variance, and the other factors are of little importance.

Table 7: FACTORS AND ITEMS

FOR HONG KONG (HK) AND AMERICAN (NA) GROUPS

Concept	Factor	Group			
		HK		NA	
		Father	Mother	Father	Mother
Treated	Concerned (Affection)	8, 13, 1, 12, 15	13, 12, 15, 1, 11, 9	1, 15, 3	1, 15, 13
	Restricted (Potency)	2, 4, 3	4, 2, 6	2, 4, 6, 10	2, 6, 4, 10, 3
	Sympathetic (Support)	14, 5, 6	5, 14, 7, 10	5, 14, 12, 8	5, 14
	Reasonable (Justice)	10, 7, 9		9, 11, 7, 13	
	Sensitivity (Unlabelled)		8		11, 9, 7, 12, 8
Taught	Democratic (Ambivalence)	1, 4, 6, 11, 12, 2	4, 1, 6, 11, 10, 2	4, 1, 6 11	1, 11, 6
	Demanding (Potency)	5, 9, 10, 13	9, 5, 12, 13	13, 9, 5, 8	9, 5
	Laxity (Irritability)	7, 8	8, 7	7, 12, 10, 8	8, 7, 12, 13, 3
	Support (Support)	3	3	3	
	Encouraging (Tolerance)	14	14	2	2, 10, 14
Disciplined	Autocratic (Potency)	10, 2, 6, 1, 12	6, 1, 2, 10, 12	6, 10, 2, 12, 1, 11	10, 12, 6, 2, 1
	Rational (Intropunitive)	4, 11, 3, 15, 8, 13	8, 15, 3, 4, 11, 13	3, 11	11, 14, 15, 8, 13, 3
	Irritability (Irritability)	5, 7,	7, 5	7, 9	5, 7
	Dictatorial (Unlabelled)	9	9		9
	Affection (Unlabelled)	14	14		

Note: 1. Factor labels in brackets are Ginsburg's original names.

2. The numerals identify those items which had loadings ≥ .40 on the specified factor.

3. Items are arranged by size of loading for each factor.

Table 8: FACTORS AND ITEMS

FOR HONG KONG (HK) AND MEXICAN (MEX) GROUPS

Concept	Factor	Group			
		HK		MEX	
		Father	Mother	Father	Mother
Treated	Concerned (Affection)	8,13, 1,12, 15	13,12,15 1,11, 9	12, 9, 1, 5,13,10	13, 1, 15
	Restricted (Potency)	2, 4, 3	4, 2, 6	4, 2, 6	4, 3, 2
	Sympathetic (Support)	14, 5, 6	5,14, 7 10	14, 5, 8	5, 9, 12, 14, 7, 10
	Reasonable (Justice)	10, 7, 9		11,15, 7	11
	Sensitivity (Unlabelled)		8		8
Taught	Democratic (Ambivalence)	1, 4, 6,11, 12, 2	4, 1, 6, 11,10, 2	6, 4,11, 1	11, 4, 6, 1
	Demanding (Potency)	5, 9,10,13	9, 5,12,13	5, 9	9, 5
	Laxity (Irritability)	7, 8	8, 7	7,12,10, 11,13, 8	7, 8, 12, 13,10
	Support (Support)	3	3		
	Encouraging (Tolerance)	14	14	14, 3	2, 3
Disciplined	Autocratic (Potency)	10, 2, 6, 1,12	6, 1, 2, 10,12	10, 6, 2, 12	10, 6, 12 2
	Rational (Intropunitive)	4,11, 3, 15, 8,13	8,15, 3, 4,11,13	4,11, 3, 9	3, 4,15, 11 8
	Irritability (Irritability)	5, 7	7, 5	7, 5	7, 5
	Dictatorial (Unlabelled)	9	9		
	Affection (Unlabelled)	14	14	13	13,14

Note: 1. Factor labels in brackets are Ginsburg's original names.

2. The numerals identify those items which had loadings ≥ .40 on the specified factor.

3. Items are arranged by size of loading for each factor.

Table 9: COEFFICIENTS OF CONGRUENCE

AMONG HONG KONG BOY AND GIRL FACTORS IN "TREATED"

Father Treated

Girl Factors

Boy Factors	4 (9%)	1 (29%) concerned	2 (13%) restricted	5 (7%)	3 (10%)
1 (31%)	0.86	0.23	0.20	0.50	0.09
2 (15%) concerned	0.40	<u>0.93</u>	0.20	0.55	0.09
3 (9%) restricted	0.44	0.17	<u>0.89</u>	0.24	0.11
4 (7%)	-0.48	-0.41	-0.11	-0.87	0.01
5 (6%)	0.28	0.62	-0.26	0.46	-0.01

Mother Treated

Girl Factors

Boy Factors	2 (11%) concerned	1 (29%) restricted	4 (8%)	5 (7%)	3 (10%)
1 (31%) concerned	<u>0.67</u>	0.44	0.50	0.05	0.47
2 (14%) restricted	0.30	<u>0.88</u>	0.39	0.24	0.17
3 (9%)	0.79	0.19	0.63	0.18	-0.17
4 (7%)	0.02	-0.18	-0.03	-0.74	0.16
5 (6%)	-0.23	-0.68	-0.58	-0.17	-0.03

Note: 1. Percentage of total variance is given in brackets.

2. The coefficients of congruence of the two factors to be studied are underlined.

3. Numbering of factors indicates order of extraction.

Table 10: COEFFICIENTS OF CONGRUENCE

AMONG HONG KONG BOY AND GIRL FACTORS IN "TAUGHT"

Father Taught

		Girl Factors				
		1 (33%) democratic	2 (15%) demanding	4 (7%)	5 (6%)	3 (11%)
Boy Factors	1 (29%) democratic	<u>0.93</u>	-0.25	-0.29	0.50	0.17
	2 (15%) demanding	-0.17	<u>0.75</u>	0.39	-0.44	-0.45
	3 (9%)	0.08	0.14	0.58	-0.04	0.25
	4 (7%)	0.01	0.42	0.37	0.28	0.01
	5 (7%)	0.07	-0.51	-0.07	0.01	0.90

Mother Taught

		Girl Factors				
		2 (13%) democratic	1 (34%) demanding	5 (7%)	3 (8%)	4 (7%)
Boy Factors	1 (23%) democratic	<u>0.84</u>	-0.67	-0.14	0.10	0.49
	2 (15%) demanding	-0.09	<u>0.77</u>	0.90	-0.02	-0.24
	3 (9%)	-0.18	-0.10	0.92	0.45	0.45
	4 (8%)	0.19	-0.18	-0.23	0.54	-0.18
	5 (8%)	-0.09	0.13	0.90	-0.03	0.61

Note: 1. Percentage of total variance is given in brackets.

2. The coefficients of congruence of the two factors to be used are underlined.

3. Numbering of factors indicates order of extraction.

Table 11: COEFFICIENTS OF CONGRUENCE

AMONG HONG KONG BOY AND GIRL FACTORS IN "DISCIPLINED"

Father Disciplined

		Girl Factors				
		2 (17%) autocratic	1 (32%) rational	4 (6%)	3 (9%)	5 (6%)
Boy Factors	1 (36%) autocratic	0.96	-0.26	0.15	0.27	0.26
	2 (16%) rational	-0.28	0.92	-0.65	-0.31	-0.44
	3 (8%)	0.07	-0.16	0.52	0.39	0.34
	4 (7%)	0.57	-0.42	0.39	0.47	0.15
	5 (5%)	0.21	-0.43	0.23	0.25	0.63

Mother Disciplined

		Girl Factors				
		2 (12%) rational	1 (36%) autocratic	3 (8%)	5 (6%)	4 (8%)
Boy Factors	1 (32%) rational	0.68	-0.34	-0.27	0.76	0.76
	2 (15%) autocratic	-0.48	0.94	0.50	-0.36	-0.51
	3 (9%)	-0.09	0.38	0.78	-0.03	-0.23
	4 (7%)	0.25	-0.13	-0.47	0.39	-0.09
	5 (6%)	-0.02	0.23	-0.04	0.43	0.36

Note: 1. Percentage of total variance is given in brackets.

2. The coefficients of congruence of the two factors to be studied are underlined.

3. Numbering of factors indicates order of extraction.

3. Cross-Cultural Comparisons

It is generally admitted that every culture prescribes how its children should be treated, taught, and disciplined, and expects its members to behave in such ways as are approved by the group. In other words, each culture has its own specific techniques and emphases in child-rearing. Hence it is of interest to see whether similar factors appear in the responses of Hong Kong, North American, and Mexican subjects and whether these factors are of equal importance in these three groups. The comparison Tables 7 - 8 (pp. 85 and 86) show that similar items obtained high loadings in particular factors across the three groups, but the degree of similarity can be better seen by calculating Harman's coefficients of congruence, which are reported in Tables 12-17. It should be particularly pointed out here that Harman's coefficients of congruence provide only one of the many ways of comparing factor patterns. By the use of other methods suggested by various authors, it does not necessarily follow that the same results would be produced. However, based on the data available and the particular technique used, the following comparisons seem reasonable. It should be noted that the order of appearance of the factors in different countries may not be the same and that only the major factors are discussed in this study.

Table 12: COEFFICIENTS OF CONGRUENCE

AMONG HONG KONG (H.K.) AND NORTH AMERICAN (N.A.) FACTORS IN "TREATED"

Father Treated

N. A. Factors

		3 (5%) concerned	2 (9%) restricted	1 (48%) sympathetic	4 (3%)	5 (2%)
H.K. Factors	1 (31%) concerned	0.51	0.15	-0.56	-0.49	0.45
	2 (13%) restricted	0.58	0.87	-0.37	-0.37	-0.06
	3 (8%) sympathetic	-0.42	-0.53	0.85	0.49	-0.11
	4 (7%)	-0.53	-0.48	0.64	0.73	-0.08
	5 (6%)	0.31	-0.06	-0.21	-0.06	0.09

Mother Treated

N. A. Factors

		4 (4%) concerned	2 (13%) restricted	1 (44%) sensitive	3 (4%)
H.K. Factors	1 (29%) concerned	0.75	0.33	-0.58	0.64
	2 (12%) restricted	0.46	0.91	-0.27	0.47
	3 (9%) sensitive	-0.32	-0.23	0.31	-0.27
	4 (7%)	0.59	0.59	-0.53	0.85

Note: 1. Percentage of total variance is given in brackets.

2. The coefficients of congruence of the two factors to be studied are underlined.

3. Numbering of factors indicates order of extraction.

4. Only four factors were identified for "Mother Treated" in Ginsburg's study.

Table 13: COEFFICIENTS OF CONGRUENCE

AMONG HONG KONG (H.K.) AND NORTH AMERICAN (N.A.) FACTORS IN "TAUGHT"

Father Taught

		N. A. Factors				
		2	3	1	4	5
		(9%) democratic	(6%) demanding	(37%) laxity	(4%)	(3%)
H.K. Factors	1 (31%) democratic	<u>0.89</u>	-0.29	0.53	0.23	-0.64
	2 (15%) demanding	-0.36	<u>0.86</u>	-0.64	-0.17	0.59
	3 (9%) laxity	0.32	-0.33	0.81	0.11	-0.31
	4 (7%)	0.17	-0.31	0.08	0.74	-0.08
	5 (6%)	-0.36	0.05	-0.53	0.03	0.66

Mother Taught

		N. A. Factors			
		2	4	1	3
		(10%) democratic	(4%) demanding	(29%) laxity	(7%)
H.K. Factors	1 (28%) democratic	<u>0.87</u>	-0.48	0.36	0.58
	2 (13%) demanding	-0.51	<u>0.82</u>	-0.72	-0.67
	3 (8%) laxity	0.05	-0.22	0.69	0.12
	4 (8%)	0.09	-0.31	0.26	0.07

Note: 1. Percentage of total variance is given in brackets.

2. The coefficients of congruence of the two factors to be studied are underlined.

3. Numbering of factors indicates order of extraction.

4. Only four factors were identified for "Mother Taught" in Ginsburg's study.

Table 14: COEFFICIENTS OF CONGRUENCE

AMONG HONG KONG (H.K.) AND NORTH AMERICAN (N.A.) FACTORS IN "DISCIPLINED"

Father Disciplined

		N. A. Factors				
		1 (35°/o) autocratic	3 (5°/o) rational	5 (2°/o)	4 (3°/o)	2 (12°/o)
H.K. Factors	1 (35°/o) autocratic	0.97	0.33	-0.29	-0.50	-0.27
	2 (16°/o) rational	0.42	0.86	-0.75	-0.52	-0.56
	3 (7°/o)	-0.09	-0.15	0.02	0.50	0.02
	4 (7°/o)	-0.55	-0.52	0.29	0.76	0.43
	5 (6°/o)	-0.34	-0.46	0.55	0.51	0.87

Mother Disciplined

		N. A. Factors				
		2 (13°/o) rational	1 (35°/o) autocratic	3 (4°/o)	4 (3°/o)	5 (3°/o)
H.K. Factors	1 (33°/o) rational	0.89	-0.48	-0.61	0.51	-0.32
	2 (13°/o) autocratic	-0.38	0.96	0.50	-0.37	0.76
	3 (8°/o)	-0.29	0.45	0.77	-0.33	0.39
	4 (7°/o)	0.24	-0.13	-0.37	0.88	-0.17
	5 (6°/o)	-0.81	0.30	0.25	-0.24	0.38

Note: 1. Percentage of total variance is given in brackets.

2. The coefficients of congruence of the two factors to be studied are underlined.

3. Numbering of factors indicates order of extraction.

From Tables 12-14, it may be seen that the first two important factors for each concept in the Hong Kong group have their counterparts in North American subjects. Their coefficients of congruence for father are all above 0.86 except one, which is 0.51, while those for mother are all rather high, ranging from 0.75 to 0.96. In spite of this high congruence of the corresponding pairs of factors, there are some interesting differences in their relative importance as shown by the percentage of variance for which they account.

In the response area "Treated", the 'concerned' factor for father has much greater prominence for the Chinese, as shown by the percentage of tatal variance (31%) than the corresponding factor among Americans (5%). It may be inferred that paternal affection is more influential among Chinese than in North America. This finding seems to be in accord with what has been observed by many regarding the Chinese and American cultures: perhaps also warmth of relationship is universal in North America but more varied in Hong Kong. In Hong Kong, family pressures for success are all pervasive and perhaps it is the warmth of the parental relationship that is more varied and therefore critical in affecting achievement. Also, the 'restricted' factor for father appeared to be more important in Hong Kong than in America. For mother, it was found that the 'concerned' and 'restricted' factors explain 4% and 13% of the total variance of the North American group as compared with 29% and 12% for Hong Kong. This shows that as for the fathers, the American mothers are also more uniform in their 'concerned' behaviour than their Hong Kong counterparts.

In the response area "Taught", the 'democratic' factor for

father has much greater importance for the Chinese (31% total variance) than was found to be the case in North America (9% total variance). Perhaps Chinese fathers show greater extremes of democratic behaviour than do Americans. Again this statistical finding seems tenable from a knowledge of Chinese and American family structures. American fathers are perhaps more uniform in their democratic behaviour than the Chinese fathers in Hong Kong, where a great variation exists among the different income groups and educational levels. It was also found that the 'demanding' factor for father played a more important role in Hong Kong than in North America. For mother, it is shown that the 'democratic' and 'demanding' factors account for 10% and 4% of the total variance in the North American results, but the same factors in Hong Kong explain 28% and 13%. This suggests that Hong Kong mothers are relatively much more varied in their 'democratic' behaviour towards their children than North Americans.

In the response area "Disciplined", the 'autocratic' factor for father is the most important for Chinese and Americans, and the difference in variance of the 'rational' factors is not large. It is of much interest to see that the importance of the two major factors 'autocratic' and 'rational' for mother is reversed in these two places. For North America, these two factors explain 35% and 13% of the total variance as compared with 13% and 33% respectively for Hong Kong.

It should be noted that the most important factor for "Father Treated" in North America is 'sympathetic' (48% variance versus 8% in Hong Kong), suggesting that North American fathers are much more varied in their sympathetic behaviour towards their children than Hong Kong fathers. However, the most important factor for American "Mother Treated" is 'sensitive', explaining

44% of the total variance (versus 9% for Hong Kong). This seems to imply that in the judgment of the children the major area of variation in American mothers is their sensitive treatment of their children. Also, the most important factor for both "Father Taught" and "Mother Taught" in North America is 'laxity', again much more important than the corresponding factor for Hong Kong (37% versus 9% and 29% versus 8% respectively), indicating that North American parents are less uniform in their laxity behaviour than their counterparts in Hong Kong. Thus the above considerations show rather clearly that there are cultural differences in the order of importance of the various parental factors. Such cultural differences are understandable in view of the contrasting social, cultural, educational, and economic structures of the two countries.

The above discussion points out some of the important differences in the roles played by the various factors in the two basically different cultures --- the American and the Chinese --- as judged by thesedata. In view of the fact that Chinese mothers are in general comparatively less educated than their counterparts in America and that emphasis on education has been centred on the male sex for thousands of years, it is not surprising to find that Hong Kong mothers are much more varied in their favourable behaviour like 'concerned', 'democratic', and 'rational'. On the other hand, in North America, mothers are in general considered to be more liberal and also better formally educated, hence they tend to have more uniformity in their favourable behaviour. Moreover, the more uniform or 'universal' unfavourable behaviour of Hong Kong mothers seems to be related to the special situation in Hong Kong where life is highly competitive, and perhaps such measures as 'restricted',

'demanding', and 'autocratic' are thought by mothers to be "beneficial" for their children in the local circumstance and tradition.

Putting together at this point, it appears that the parental factors under study are in general more important in Hong Kong than in North America, except that 'mother restricted' and 'father autocratic' tend to be the same in these two places, and that while 'mother rational' appears to be more important for Hong Kong, 'mother autocratic' more so for North America.

Table 15: COEFFICIENTS OF CONGRUENCE

AMONG HONG KONG AND MEXICAN FACTORS IN "TREATED"

Father Treated

MEX Factors

		1 (30°/o) concerned	2 (15°/o) restricted	3 (4°/o)	5 (3°/o)	4 (3°/o)
H.K. Factors	1 (31°/o) concerned	0.61	0.12	-0.41	-0.56	0.31
	2 (13°/o) restricted	0.19	0.86	-0.20	0.09	0.44
	3 (8°/o)	-0.56	-0.42	0.72	0.13	-0.07
	4 (7°/o)	-0.83	0.26	0.53	0.62	0.10
	5 (6°/o)	0.55	0.12	-0.07	0.67	0.21

Mother Treated

MEX Factors

		3 (5°/o) concerned	4 (5°/o) restricted	5 (4°/o)	1 (28°/o) sympathetic	2 (11°/o)
H.K. Factors	1 (29°/o) concerned	0.85	0.27	0.54	0.73	-0.41
	2 (12°/o) restricted	0.22	0.79	-0.11	0.46	0.26
	3 (9°/o)	-0.37	-0.14	0.22	-0.13	0.16
	4 (7°/o) sympathetic	0.32	0.49	0.44	0.87	-0.14
	5 (6°/o)	0.17	0.45	0.28	0.05	0.36

Note: 1. Percentage of total variance is given in brackets.

2. The coefficients of congruence of the two factors to be studied are underlined.

3. Numbering of factors indicates order of extraction.

Table 16: COEFFICIENTS OF CONGRUENCE

AMONG HONGKONG (H.K.) AND MEXICAN (MEX) FACTORS IN "TAUGHT"

Father Taught

MEX Factors

		2 (13%) democratic	3 (6%) demanding	1 (23%) laxity	4 (4%)
H.K. Factors	1 (31%) democratic	0.87	-0.10	0.44	0.47
	2 (15%) demanding	-0.16	0.79	-0.60	-0.23
	3 (9%) laxity	0.11	-0.53	0.77	0.22
	4 (7%)	0.20	-0.08	0.03	0.65

Mother Taught

MEX Factors

		1 (20%) democratic	3 (6%) demanding	2 (14%) laxity	4 (4%)
H.K. Factors	1 (28%) democratic	0.72	-0.16	0.27	0.02
	2 (13%) demanding	-0.08	0.65	-0.66	0.41
	3 (8%) laxity	-0.14	-0.40	0.72	0.11
	4 (8%)	0.17	0.15	0.13	0.34

Note: 1. Percentage of total variance is given in brackets.

2. The coefficients of congruence of the two factors to be studied are underlined.

3. Only four factors were identified for the Taught concepts in Ginsburg's study.

4. Numbering of factors indicates order of extraction.

Table 17: COEFFICIENTS OF CONGRUENCE

AMONG HONG KONG (H.K.) AND MEXICAN (MEX) FACTORS IN "DISCIPLINED"

Father Disciplined

MEX Factors

		1 (23°/o) autocratic	2 (10°/o) rational	5 (3°/o)	4 (4°/o)	3 (7°/o)
H.K. Factors	1 (35°/o) autocratic	0.94	0.41	0.21	-0.58	-0.19
	2 (16°/o) rational	0.26	0.85	0.46	-0.29	-0.61
	3 (7°/o)	-0.17	-0.43	0.26	0.10	0.15
	4 (7°/o)	-0.40	-0.33	-0.54	0.80	0.37
	5 (6°/o)	-0.19	-0.44	-0.64	0.31	0.77

Mother Disciplined

MEX Factors

		2 (15°/o) rational	3 (10°/o) autocratic	1 (22°/o) irritability	4 (5°/o)	5 (3°/o)
H.K. Factors	1 (33°/o) rational	0.90	-0.39	-0.18	0.15	-0.41
	2 (13°/o) autocratic	-0.35	0.83	0.39	-0.75	0.29
	3 (8°/o) irritability	-0.06	0.33	0.89	-0.38	0.33
	4 (7°/o)	0.16	-0.10	-0.11	0.22	-0.31
	5 (6°/o)	0.46	-0.17	0.32	-0.16	0.77

Note: 1. Percentage of total variance is given in brackets.

2. The coefficients of congruence of the two factors to be studied are underlined.

3. Numbering of factors indicates order of extraction.

Tables 15-17 show that for the first two factors of each concept, the coefficients of congruence between Hong Kong and Mexican factors range from 0.61 to 0.94. Among the twelve values, two are above 0.90, five above 0.83, three above 0.72, and two above 0.61. The interesting point emerging from these results is that these factors are rather similar and stable across cultures. However, as in the Hong Kong and North American comparison, there are also interesting differences in their relative influence within the pattern.

In the "Treated" response area, both the 'concerned' and 'restricted' factors for Hong Kong and Mexican fathers have approximately the same variance. However, the maternal 'concerned' and 'restricted' factors contribute 29% and 12% total variance in Hong Kong compared with only 5% and 5% total variance in Mexico. This seems to suggest in terms of these data that Hong Kong mothers are more varied in their 'concerned' and 'restricted' behaviour than Mexican.

In the "Taught" response area, both the 'democratic' and 'demanding' factors for Hong Kong fathers are more than twice as important as for the Mexican fathers. Also, these two factors are more influential for Hong Kong mothers than for Mexican. It appears from this evidence that Hong Kong parents differ to a much greater extent in their 'democratic' and 'demanding' behaviour than Mexican parents.

In the "Disciplined" response area, again, the Hong Kong parents show greater variation in the 'autocratic' and 'rational' factors than do the Mexican parents. Interestingly, we found that the Hong Kong maternal 'rational' factor has more than twice the variance of the Mexican factor.

The above findings show that in general the parental factors which it is intended will be studied in greater detail later, are more important for Hong Kong than for Mexican students. It should be noted that the most important Mexican factor in the mother "Treated" area is 'sympathetic' (28% total variance for Mexican data versus 7% for Hong Kong); for father and mother "Taught" areas the most important is 'laxity' (23% for Mexico versus 9% for Hong Kong and 14% versus 8% respectively); and for mother "Disciplined" area, 'irritability' is highest (22% for Mexico versus 8% for Hong Kong). These results indicate that Mexican fathers are more varied in their laxity behaviour and Mexican mothers are more varied in their sympathetic, laxity, and irritable behaviour towards their children. Such findings may again be attributed to cultural differences between Mexico and Hong Kong.

Summing up the discussion in this section, the findings from the comparisons of Hong Kong, American, and Mexican factors show rather clearly that the factors to be investigated in this study, namely 'concerned', 'restricted', 'democratic', 'demanding', 'autocratic', and 'rational', are common across cultures but appear in general to be more important in Hong Kong than in North America and in Mexico.

4. An Appraisal

The cross-cultural evidence available in this chapter and also later in this study clearly suggest that the Parent Image Differential Test is a reasonably suitable instrument for use in assessing parent-child interaction from the child's point of view. This "subject's point of view" is believed to be more important and meaningful for present purposes than that of the parents. Also it is necessary to realise that what matters is how the child perceives the situation rather than the "actual situation" which is emphasised, and this is what the Parent Image Differential Test professes to measure.

The traditional approach to studying parental behaviour consists of home visits and direct observations, using judges and rating scales. We suspect that this method tends to be more subjective than the common parental questionnaire methods. Furthermore, questionnaire methods suffer always from the difficulty of ensuring a good response and reliable information from parents. Various research workers have already found parents to be somewhat biassed informants: they tend not to tell exactly how they interact with their children, especially in cases where they know they display unfavourable behaviour tendencies towards their children -- and these are the cases of special interest in a sampling study. On the other hand, children's responses tend more often to be genuine and reliable, and it is easier to make sure that all children in school conditions complete a questionnaire or test and give a frank and honest opinion, especially when they know that their opinion would be treated confidentially.

The Parent Image Differential Test was designed to investigate recalled parent-child interaction, i.e., "how my

father and mother treated, taught, and disciplined me when I was a child: from earliest memory to about fourteen years of age". Parent-child interaction during this childhood period could not be studied directly, and may be investigated only by recall or memory. It seems likely that in situations close to themselves, children can very often recall their personal experiences at least from about age 6 with greater accuracy than their parents can. Hence, the use of Ginsburg PID Test would not only make possible the investigation of childhood parent-child interaction in relation to adolescent psychological attributes as in this study but also is likely to yield more reliable results.

Apparently, the PID Test has attempted to sample the major dimensions covering the whole domain of parental behaviour in relation to parent-child interaction. Factor analyses in this study showed that about half the variance in children's responses could be accounted for by two main components in each of the six fundamental parental concepts, namely father and mother "Treated", "Taught", and "Disciplined". The total twelve factors identified could then be conveniently studied as the important parental variables. The results of this investigation appeared to show that the semantic differential is an appropriate format for eliciting children's responses in the main perceptual areas of parent-child interaction. Another feature of the PID Test is that the items for both father and mother concepts are the same. This seems to be an advantage in that the children can easily indicate parental differences by putting the mark at a different position on the scale.

The above considerations support the argument that the Parent Image Differential Test is a psychologically sound and

technically convenient test to use in studying parent-child relationships in situations such as pertain in this study.

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CHAPTER FIVE

TEST CONSTRUCTION

The problem was to construct and adapt instruments to measure variables bearing on the relation of parent-child interaction with the child's intelligence and attitudes, and a first step was to find useful existing measures in this area. The Ginsburg PID Test, after the investigator's pilot investigation with this instrument in Hong Kong, as described in the last chapter, appeared a valid instrument for assessing one dimension of the parent-child relationships. Other instruments had to be selected or constructed for investigating students' cognitive and affective variables. Unfortunately, there are no established tests standardized for use with Hong Kong students at this level.

After an intensive search among existing British and American intelligence tests, the AH4, Raven's Progressive Matrices, and Cattell's Culture-fair tests appeared to be suitable for use in the Hong Kong situation at the level under investigation. However, the AH4 Test seems to have advantages over the others since it gives not only non-verbal scores, but also verbal and numerical scores, and moreover, the verbal items in the test were carefully examined and considered to be appropriate to the general English standard of Hong Kong Form IV students who were the main group to be studied. Furthermore the AH4 Test appeared not to show any marked cultural bias.

As regards the testing of the affective characteristics of the students, three sections of a Likert-type test were specially constructed by the investigator for the purposes of the present study: an "attitude to home" section, a "social interest" section, and an "academic motivation" section. An original projective test of the sentence completion type was also constructed in an

attempt to uncover underlying attitudes and to give additional information. It also served as a check on the Likert scales. A Composition Test was designed by the investigator to disclose students' attitudes to home, and a Popularity Test was prepared to determine the degree of acceptance by classmates. The present chapter describes the manner of the construction of the above tests.

1. Likert-Type Test

About one hundred items were written for each of the three aspects of investigation. They were modified several times and, after various trials, were gradually edited and reduced to sixty items each, other items being eliminated on the basis of their overlap and unsuitability. This made up a total of 180 items in all. Equal numbers of positive and negative items (i.e., 90 each) were used in order to decide which kind was more appropriate in the Hong Kong situation. During item writing, the criteria set by Edwards[1] (1957) for editing attitude items were used as a guide. Statements that were factual, ambiguous, irrelevant, double-barrelled, double negative, or which were leading in nature were avoided. On the other hand, the language of the statements was kept simple, clear, short, and direct, and this was considered particularly important for the Hong Kong Chinese students whose mother tongue is not English. Also, an attempt was made to write meaningful, interesting, and even exciting statements for these students, so that their interest and motivation in answering the items might be maximized.

All these selected positive and negative items in the attitude, interest, and motivation areas were mixed at random in the pre-test (Appendix 3), and covered as many dimensions as possible. The number of items was restricted, otherwise it was felt the test would become too long and the students would tend

to become impatient and this in turn could lead to careless answering and unreliable responses. The present pre-test therefore is 180-items long, and this was considered to be of suitable length for a pilot study at the level of the students under investigation.

As regards the types of items used, the "attitude to home" section asks about students' reactions to home, parents, brothers and sisters. The section on "social interest" consists of items tapping their feelings towards friends, school and social activities, and their concern for others. The section on "academic motivation" has items which call forth responses to school work, examinations, teachers, and education. A careful scrutiny and the use of a few impartial judges gave some assurance that the coverage was appropriate and adequate.

Since both the reliability and validity of a test depend ultimately upon the characteristics of the items of which it is made up, only those items which comply with the purpose of the test and which satisfactorily discriminate between the positive and negative poles of the attitudes should be selected. Thus item analysis is an essential process for securing the reliability and validity of such a test. In order to ensure unidimensionality of the scales, a factor analysis technique was used in this study, in addition to the usual internal-consistency method of item analysis, i.e., the method of calculating correlation coefficients between each item and the total score, and re-editing the material by retaining those with the highest correlations. The pre-test was applied to a sample of 160 students and each intercorrelation matrix of the items was factor analysed by the method of principal components, followed by varimax rotation to produce a minimum number of independent dimensions needed to account for

most of the variance in the original set of items. Seven factors (two for attitude, two for interest, and three for motivation) were identified as in the following Tables 18-21. Items with loadings equal to or greater than 0.3 were selected for inclusion in the final test, though two items with loadings greater than 0.2 were also included in the last two factors of motivation in order to increase the subtest length. The correlations of each item with the total score of the corresponding factor were also computed. All items were found to have correlation coefficients equal to or greater than 0.3, except three which were lower but significant. Thus respectively 21, 11, 19, 11, 11, 9, 7 items were retained for the seven factors (as set out in Tables 18-21), making up a total of 89 items. It should be noted that among the 89 items in the final test there are 42 negative items. This seems to suggest that both positive and negative items were of approximately equal value in the present study, though some factors consisted predominantly of positive, others mainly of negative, items.

The items of these seven chosen factors were again mixed in a random manner in the final test (Appendix 4) so that the students would not detect the purposes of the test too easily, and hence their responses were likely to be more spontaneous and valid, and also more likely to reveal their true selves. This final test of 89 items appeared to be of a reasonable length for administration in a normal school period of thirty-five minutes duration.

Table 18: "ATTITUDE TO HOME" FACTORS

Factor 1: 'Affiliation' (21 items)

(23% of total variance)

		Loading	Correlation with Total
46.	I like to spend most of my time with my parents.	0.81	0.74
56.	I spend very little time at home.	-0.81	-0.74
57.	My parents often ask about my schoolwork.	0.76	0.69
44.	When I am in difficulty, my parents always give their advice.	0.66	0.63
52.	I don't care what my parents think of me.	-0.63	-0.70
47.	I like to work with my parents.	0.62	0.71
32.	My parents understand me.	0.59	0.72
30.	I wish my parents would be with me all my life.	0.58	0.70
34.	My home has all the comfort in the world.	0.56	0.73
60.	I wish I could stay with my brothers and sisters all my life.	0.56	0.73
42.	My parents like me.	0.49	0.68
25.	My parents always comfort me whenever I am upset in school.	0.47	0.58
19.	I like to stay at home as much of the time as possible.	0.45	0.54
55.	I find it difficult to discuss my problems with my parents.	-0.45	-0.62
16.	I think of home all the time.	0.44	0.62
39.	I sometimes quarrel with my brothers and sisters.	-0.43	-0.24
36.	I am proud of my family.	0.36	0.60
1.	I feel happy at home.	0.36	0.57
8.	I feel rather lost when I am away from home.	0.36	0.47
50.	I wish I could help my parents in their work.	0.34	0.54
11.	I like to be with my friends rather than my parents.	-0.32	-0.44

Factor 2: 'Frustration' (11 items)

(6% of total variance)

41.	My parents do not allow me to go out by myself.	-0.66	0.54
58.	I always try to avoid my parents.	-0.66	0.54
35.	I feel rather disappointed with the conditions of my home.	-0.53	0.57
2.	I would rather leave home.	-0.52	0.62
28.	I can never find peace at home.	-0.52	0.59
26.	I am ashamed of my family.	-0.51	0.56
40.	At home I am never free to do what I want.	-0.38	0.53
31.	My parents are always finding fault with me.	-0.38	0.38
23.	I feel lonely at home.	-0.37	0.53
22.	At home everything seems to be against me.	-0.36	0.55
43.	My parents like my brothers and sisters more than me.	-0.33	0.44

Table 19: "SOCIAL INTEREST" FACTORS

Factor 1: 'Affiliation' (19 items)

(14% of total variance)

		Loading	Correlation with Total
48.	I enjoy going for a walk with friends.	0.70	0.73
59.	I don't get to know people easily.	-0.69	-0.73
20.	I like making new friends all the time.	0.57	0.55
29.	I feel happiest when there are people around.	0.57	0.67
26.	Whenever I meet a friend, I find I keep him talking for a long time.	0.53	0.54
34.	I enjoy making fun of others.	-0.53	-0.48
14.	I like participating in club activities.	0.48	0.55
49.	I enjoy listening to records with friends.	0.46	0.54
4.	I spend the whole evening talking with friends.	0.43	0.53
33.	I would do my best to please my friends.	0.41	0.40
16.	I like meeting people from other countries.	0.40	0.48
56.	I always try to be helpful to others.	0.38	0.52
15.	I like organising parties.	0.34	0.45
55.	I like to know how my friends are getting on in other places.	0.34	0.38
19.	I value friendship.	0.34	0.50
21.	I go out with friends very often.	0.33	0.47
7.	I enjoy acting as leader in a group.	0.32	0.36
9.	I like to help my friends.	0.32	0.47
44.	I like going to the cinema with a number of friends.	0.30	0.43

Factor 2: 'Individuality' (11 items)

(6% of total variance)

42.	I don't care what my classmates think of me.	-0.54	0.59
35.	I like to be different from others.	-0.50	0.48
53.	Very often I am misunderstood by others.	-0.47	0.42
30.	I like to be by myself.	-0.46	0.56
52.	I am sometimes impatient with others.	-0.46	0.38
39.	I am not interested in what other people are doing.	-0.46	0.40
32.	I don't follow what my friends do.	-0.46	0.39
11.	I spend a lot of time visiting friends.	0.43	-0.33
60.	My friends take up very much of my time.	0.42	-0.33
51.	I am not interested in what other people say.	-0.35	0.35
23.	I don't care very much what others think of me.	-0.33	0.45

Table 20: "ACADEMIC MOTIVATION" FACTORS

Factor 1: 'School Work' (11 items)

(13% of total variance)

		Loading	Correlation with Total
46.	I don't mind going to school or not.	-0.71	0.68
41.	I never pay attention to my teachers' remarks of my work.	-0.62	0.60
28.	I don't care whether I am a good student or not.	-0.56	0.64
3.	I find school life dull.	-0.51	0.54
10.	I am only in school because my parents send me here.	-0.50	0.53
47.	What I learn in school will not help my future career.	-0.49	0.55
16.	I don't mind very much about my school results.	-0.46	0.49
51.	I don't feel upset when I fail in examination.	-0.38	0.55
5.	School is just not the place for me.	-0.36	0.44
42.	I never bother to think about what to do tomorrow.	-0.34	0.38
2.	I prefer working outside to studying in school.	-0.30	0.32

Factor 2: 'Intrinsic Motives' (9 items)

(5% of total variance)

35.	I like to learn new things.	0.68	0.70
60.	It is not worthwhile spending time in the library.	-0.55	-0.64
22.	I always try to improve myself.	0.48	0.57
8.	I would prefer enjoying myself when I am still young.	-0.44	-0.54
20.	I am interested in discovering new things from books.	0.42	0.50
55.	My main interest in school is to have a nice time with my classmates.	-0.37	-0.48
6.	Nothing is better than success in life.	0.34	0.47
38.	There are other things more important than study.	-0.34	-0.27
7.	When I solve a problem, I have a great sense of satisfaction.	0.21	0.38

Table 21: "ACADEMIC MOTIVATION" FACTORS (CONT'D)

Factor 3: 'Incentive' (7 items)
(5% of total variance)

		Loading	Correlation with Total
57.	It is nice to get a prize at the end of the school year.	0.74	0.70
25.	Examinations are the opportunity for me to show my ability.	0.74	0.70
59.	Everything I learn in school has some use in future.	0.70	0.53
27.	I value education highly.	0.64	0.51
37.	I would never use my leisure time for study.	-0.31	-0.21
12.	I don't aim at university.	-0.30	-0.19
4.	I am never very good in examinations.	-0.22	-0.32

2. Sentence Completion Test

Twenty open-ended incomplete sentences were constructed for evoking the responses of the students to each of the areas --- "attitude to home", "social interest", and "academic motivation". The sentence-beginnings were designed to minimise stereotyped responses. The total sixty sentences were arranged in random order so as to avoid showing too obviously the true purposes and trends of the test, and again in order to produce responses likely to be nearer to the subjects' true feelings (Appendix 5).

Items which investigate the students' "attitude to home" ask questions relating to how they think of home, parents, brothers and sisters. Items testing their "social interest" include queries as to how they treat their friends under different conditions, such as when their friends need help, are sick, or are angry with them. Some questions also ask the subjects whether they are interested in parties, or like meeting and talking to people, or whether they enjoy discussing problems with classmates. Items for "academic motivation" seek to uncover issues like how the students think of examination marks, prizes

and scholarships, school life, and also how they regard their teachers. The students' aspirations and aims in life were also appraised by posing questions like "My future plan is ...", "My aim in life is ...", "I think university education is ...", and "I study for ...". After careful scrutiny and some independent opinions asked, it was again considered that the test had an adequate coverage of the respective areas which the investigator sought to study.

The items were tried out on the same sample of subjects as for the Likert scales. As the Sentence Completion Test is an indirect projective test, a great variety of responses could be given. Some methods of standardising the marking and ways of making the scores of the students more meaningful seemed necessary. Based on the pre-test results, the students' replies were accordingly grouped into five-point scales, 1 indicating the least favourable answers and 5 the most favourable. Thus marking schemes for each of the three aspects under study were constructed, and they were shown to a few teachers (acting as judges) for critical comment. The final forms (as set out in Appendix 8) were produced after some discussion with the judges and were based on a fair agreement with a few colleagues on minor points of wording, etc. The pre-test results suggested that each item was capable of producing quite a variety of responses to the particular aspect under investigation, and this was what was required experimentally.

Examples of an item each from the three areas of investigation are given below:

Attitude to Home -

No. 8. The rules set by my parents are .....

Score 1: quite severe, strict, unfair to me, bad, cruel, severe, nonsense, unreasonable, not suitable, harsh, stern, unjust, etc.

Score 2: unnecessary, not useful, dull, useless, etc.,

Score 3: flexible, general, common, loose, soft, free, fussy, etc.

Score 4: reasonable, suitable for me, not bad, not very strict, considerate, kind, acceptable, correct, fair, useful, etc.

Score 5: very good for me, certainly right, etc.

Social Interest -

No. 6. When I am in a party, I .....

Score 1: like to sit in a corner, feel uneasy, feel uncomfortable, feel shy, just sit, feel lonely, do not know what to do, like to be quiet, feel sick, feel unhappy, am ashamed of myself, am not interested, feel like in a prison, etc.

Score 2: feel nothing, will not dance with strangers, feel dull, etc.

Score 3: am a guest, etc.

Score 4: feel happy, would enjoy myself, dance with my partner, enjoy it, try to be outstanding, etc.

Score 5: dance all the time, feel very happy, feel very excited, like to know as many people as possible, will make new friends, etc.

Academic Motivation -

No. 14. If my examination results are not good this time, I .....

Score 1: don't mind, don't feel surprised, give up, feel nothing, would do nothing, etc.

Score 2: feel very sorry, feel very sad, feel unhappy, feel shy, feel disappointing, feel upset, feel very bad, shall punish myself, feel ashamed, feel surprised, etc.

Score 3: shall pass next time, hope to do better next time, etc.

Score 4: would work hard, shall be more diligent, shall make a better plan for study, etc.

Score 5: try my best next time, keep on trying, etc.

From the above examples it can be seen that the responses of the students regarding their reactions to home, social and academic life are well-distributed and rather distinctive. Hence such marking schemes appeared to be quite satisfactory for the purpose of discriminating students' attitudes.

The items and their correlation coefficients with their respective totals (e.g., each "attitude to home" item score being correlated with "attitude to home" total score) are given in the following Tables 22-24. It can be seen that the correlations of the sixty items are all reasonably significant, i.e., they show values appreciably higher than 0.3, except seven of them, which were discarded and not used in the final test. Hence fifty-three items were included in the final test with 20, 15, 18 items for the areas of "attitude to home", "social interest", and "academic motivation" respectively. Such a result seemed to be satisfactory in the circumstances and met the main experimental requirements of the present investigation.

Table 22: SENTENCE COMPLETION ITEMS

	"Attitude to Home" (20 items)	Correlation with Total
5.	If my parents are not happy, I feel	0.40
8.	Whenever I go out with my parents, I	0.58
11.	Things at home are	0.59
18.	I think most parents are	0.42
21.	When I think of home, I	0.72
26.	When my parents ask me about my schoolwork, I feel	0.42
28.	When my mother is alone with me, I feel	0.63
31.	The rules set by my parents are	0.50
34.	When I think of my parents, I	0.68
35.	Compared with school, home is	0.62
36.	When I am at home, I feel	0.61
42.	To stay at home is	0.55
47.	Compared with teachers, my parents are	0.50
50.	Home is the place where	0.53
53.	When I am alone with my father, I feel	0.45
55.	When I am upset by things at school, my parents	0.43
56.	What we learn at home are	0.57
57.	Compared with friends, my brothers and sisters are	0.51
59.	When I am sick, my parents	0.48
60.	When I fail to do well in examination, my parents	0.36

Table 23: SENTENCE COMPLETION ITEMS (CONT'D)

	"Social Interest" (15 items)	Correlation with Total	
3.	When my friends need help, I	0.26	(not used)
6.	When my friends are sick, I	0.48	
7.	When my classmates borrow my notes, I	0.32	
14.	If my friend fails in examination, I	0.48	
15.	If my friends annoy me, I	0.41	
20.	When I am in a party, I	0.43	
22.	When a stranger sits beside me, I	0.22	(not used)
23.	When people look at me, I feel	0.08	(not used)
24.	When I am neglected, I feel	0.32	
27.	When somebody is unkind to me, I	0.31	
29.	If I do not agree with my friends, I	0.37	
30.	If someone bothers me when I am busy, I	0.24	(not used)
33.	When my friends leave me, I feel	0.39	
38.	If my friend gets angry with me, I	0.43	
43.	If my classmates laugh at me, I	0.35	
46.	When I am invited to a party, I feel	0.44	
48.	Talking to friends is	0.21	(not used)
51.	Studying with friends is	0.37	
54.	Friendship to me is	0.39	
58.	Writing letters to friends is	0.40	

Table 24: SENTENCE COMPLETION ITEMS (CONT'D)

	"Academic Motivation" (18 items)	Correlation with Total	
1.	Getting good marks in school is	0.31	
2.	If I am late for school, I feel	0.34	
4.	Prizes and scholarships are	0.43	
9.	I think teachers are	0.46	
10.	My future plan is	0.49	
12.	School life is	0.60	
13.	If I do not succeed in my first attempt, I	0.39	
16.	Success in school is	0.46	
17.	Most things I learn in school are	0.40	
19.	I am interested in	0.36	
25.	My aim in life is	0.37	
32.	I think university education is	0.46	
37.	As soon as I finish school, I	0.37	
39.	If my examination results are not good this time, I	0.45	
40.	I study for	0.38	
41.	If I could not finish my homework in time, I	0.40	
44.	To do better than others is	0.28	(not used)
45.	When there is some difficult work, I	0.45	
49.	After I have done my homework, I	0.30	(not used)
52.	Studying hard is	0.46	

3. Composition Test

Several topics like 'my home', 'my parents', 'my family', and 'my family life' were suggested after careful consideration and after much reading and discussion with colleagues. It was finally decided to use 'my family life' (Appendix 6) as the topic for composition, because it was considered that such a topic would give a wider scope for expressing feelings. It was hoped that responses to this topic would reveal attitude towards home much more incidentally and naturally. The results of the composition test from a pre-test sample of 160 students showed that the answers were satisfactory for our present purposes. Again, as in the Sentence Completion Test, these responses were classified on a five-point scale, 1 being the least favourable and 5 the most favourable score. Based on the responses of the pre-test sample, a marking scheme was formulated (Appendix 9) and in general, 1 point was given for answers with descriptive phrases like: "empty", "lifeless", "forbidding", "lack of understanding", "broken", "isolated", "badly treated", "loss of parents", "like jail", "extremely dull", "divorced parents", "cannot get along with parents", "quarrelsome parents", "strict", "hate", "fear", etc. 2 points were given for answers having less extreme phrases, such as "do not agree", "do not care", "somewhat lonely", etc. 3 represented a medium position and often gave a description of routine daily life with no particular expression of feeling, i.e., neither good nor bad, neither happy nor sad. 4 covered more affective phrases like "kind", "love", "fair", "encouraging", etc. 5 covered phrases showing very marked or great affection like "very kind", "very happy ","very interesting", "warmth", "full of love", "proud of home", "peace", "concern", "full of colours", "sweet", "ideal", "wonderful", etc. It should be pointed out

that a particular score (i.e., 1 to 5) was given on the basis of overall feeling of the student and not by counting the number of descriptive phrases in the answer nor by the length of the answer. A representative example of each score point is given below for illustration of the principles underlying the use and scaling of the Composition Test:

My Family Life

Score 1: I live with my brothers, sisters, and parents. I am the third one among my brothers and sisters. Everyday I get up at half-past-seven and go to the school at eight. At noon, I go home for lunch, because my school is not far away from home. After school, I do my homework and have dinner at seven. After dinner, I read newspapers, books, or listen to the radio. Sometimes I help my mother do housework. I wash all my clothes. On holiday, I wash school uniforms of my brothers and sisters. My family life is extremely dull.

Score 2: My family life is not very enjoyable. The whole family treats me not too badly. Sometimes we talk happily together, but sometimes my brothers and sisters quarrel violently with me. Their personalities are quite different from mine, and therefore I feel somewhat lonely.

Score 3: I have two brothers and one sister. There are altogether six members in my family. I go to school at eight every morning. After school, I go home. I do my homework every day. When I am free, I help my mother.

Score 4: The members of my family are: father, mother, two brothers, two sisters and myself. My father is a worker; he works in a factory. He is a good father. My mother stays at home to do housework and always looks after us. She is a good mother. My eldest brother is an engineer; he works in a large factory. When he has time, he invites us to a picnic. My younger brother is still at school. My eldest sister also works in a factory. My youngest sister is very small, and my mother loves her very much. I help my mother after finishing my homework.

Score 5: Family life is very important, because without family one will become lonely and lose interest in everything. I think I am lucky to have a happy family. I have seven sisters and we have a lot to talk about. We also do things together at home happily. My parents are very kind; they always teach us how to behave. They love us very much, and we all respect them. I can say that my family life is very interesting indeed.

Note: The underlined keywords indicate rather clearly how the students feel about their home.

4. Popularity Test

This test consists of only two questions. The first question asks the students to give the names of five classmates whom they like most, and the second question asks for the names of five classmates whom they like least in their class (Appendix 7). This is a sociometric-type device (Moreno,[2] 1934). It may be pointed out that most sociometrists nowadays tend not to ask for disliked students, but it was found that the subjects in the present study did not show any objection, especially when they knew that the information was to be used only for research purposes (and not "against" their classmates in any way) and would be kept strictly confidential. These issues were clarified with teachers and students and confirmed clearly in both the pre-test and final test samples, and therefore it was considered appropriate to ask such questions within the context of this investigation.

This sociometric-type procedure was considered an appropriate mode of testing since such a voting situation is similar to the students' election of their own class monitors at the beginning of every year or half-year. In general they elect the classmates whom they like most to be their leaders by secret ballots or by a show of hands. The monitors are as a rule the most popular among their classmates, though they are not necessarily the best in school work. The present test adopted the same secret voting procedure, because it was believed that the choices would be more spontaneous if they were made privately and in confidence. Consequently, it was felt that the students could choose their likes and dislikes more freely. Also, it was considered that the students should know one another reasonably well by the time of testing, i.e., by the middle of the final

school term. Five popular and five unpopular students were asked because it was believed to be difficult for the students to give only the best one or the worst one. If more than one name for each category were asked for, it was felt that the students could decide more easily. On the other hand, if too many names were required, the students would also have difficulty in identifying their likes and dislikes. Furthermore, it was thought that, ideally, the number of choices or rejections made by each student should not be restricted. In practice, however, most students give between 3 and 7 names. After consulting several teachers and according to the personal classroom experience of the investigator, a compromise was reached and it was decided to ask for five of each kind.

The choice scores of the students were converted into percentage scores, e.g., when a student obtained 5 votes (popular or unpopular) in a class of 41, his percentage score would be $\frac{\text{no. of votes}}{n-1} = 12.5$, where n = total number of students in class. It was considered that such a measure would render scores more comparable from one school to another and better serve our present limited research purposes. Furthermore, it was intended to use the favourable and unfavourable percentages either separately or combined, depending on the strength of correlation between the likes and dislikes. If this proved to be quite high, eg., -0.6 or over, it was considered likely that the positive and negative ratings were measuring the same thing, and accordingly they would be combined.

This completed the construction and adaptation of the measures to be used in the present investigation. Various small pilot-runs and a critical consideration of the nature and purposes of the instruments suggested that they were very likely to meet the experimental requirements.

References

1. Edwards, A.L. (1957) Techniques of Attitude Scale Construction. New York: Appleton-Century-Crofts.
2. Moreno, J.L. (1934) Who Shall Survive? New York: Beacon House, 1953.

CHAPTER SIX

THE INVESTIGATION

1. Areas and Tests

In the formulation of hypotheses for this study, the main areas of investigation have been outlined. Let us now examine these enquiry areas more closely and discuss in some detail the rationale and the use of particular types of test.

(a) Parent-Child Interaction

The three main areas of parent-child interaction to be investigated are treatment, teaching, and discipline, as studied by Ginsburg et al.[1] (1970). These major areas of parent-child interaction were considered to be particularly significant in the Hong Kong situation, so that this was a further reason for using Ginsburg PID Test in the present study. The semantic differential items of the PID Test are arbitrarily weighted from 1 to 7, with 1 for the negative pole and 7 for the positive pole, i.e., the favourable pole always has the higher score, whether it is on the left or right hand side. The location of the favourable pole is randomized so as to try to minimize response set due to position. The following important factors were identified (Chapter Four):

Father Treated - 'concerned', 'restricted'

Mother Treated - 'concerned', 'restricted'

Father Taught - 'democratic', 'demanding'

Mother Taught - 'democratic', 'demanding'

Father Disciplined - 'autocratic', 'rational'

Mother Disciplined - 'rational', 'autocratic'

It should be particularly noted that a high score for the above means more 'concerned', 'democratic' and 'rational', but less 'restricted', 'demanding' and 'autocratic'.

The 'concerned' factor in treatment is defined as concerned, sensitive, warm, encouraging, close, consistent, and just, while the 'restricted' factor is defined as stern, hard, tense, and severe. The 'democratic' factor in teaching describes frequent discussion, skilful teaching, togetherness, understanding, patience, encouragement, and open-mindedness of the parents, while the 'demanding' factor describes sternness, hardness, and criticism of the parents. The 'autocratic' factor in discipline represents parents' sternness, hardness, severity, frequent punishment, and strictness, but the 'rational' factor represents parents' persuasiveness, reasonableness, explanation of punishment, and the children's reaction, when punished, to blame themselves, feel guilty, and to yield to parents. These factors were considered to cover the essential aspects of parental treatment, teaching, and discipline. It should be noted that the 'concerned', 'restricted', 'democratic' and 'demanding' factors are of comparable importance for both father and mother, but while the 'autocratic' factor is more important than 'rational' for father, the reverse is true for mother.

(b) Cognitive Aspects

The AH4 Test (Appendix 2) was used to yield scores for four significant areas of cognitive ability: verbal, non-verbal, numerical, and general intelligence. In this test, Part I consists of 65 questions: 32 verbal and 33 numerical items. Numerical questions involve the following types of problems: directions, numerical series, and simple arithmetical computations, while verbal questions involve directions, verbal opposites, verbal analogies, and synonyms. The directions, verbal opposites and computations require "creative answers" while the rest are expressed in the form of multiple-choice questions. Part II

also consists of 65 questions, non-verbal in type, and covers the following types of operations set out in multiple-choice form: analogies, similarities, subtractions, series and superimpositions.

The norms of the AH4 Test have not yet been determined for Hong Kong and the test is relatively untried there. However, the primary interest of this study is to find out the relative scores for children with different home backgrounds and this does not call for the use of well-established norms of the traditional type. The establishment of norms suited to Hong Kong's special needs and circumstances is a considerable study in itself and may well be left to a future investigation. From the results of the pre-test and later of the final test, it was found that the test was neither too difficult nor too easy for the majority of the students and the distributions of scores in the various parts appeared to be reasonably normal (Appendix 12). Thus the use of the AH4 Test as an instrument for our present comparative purposes seems justified on experimental as well as on other more general psychological grounds.

(c) Affective Aspects

To investigate the affective areas "attitude to home", "social interest", and "academic motivation", new Likert-type scales were constructed for use specifically in this study.

The following factors were identified for further analyses (see Chapter Five for full details):

Attitude to Home: 'affiliation', 'frustration'

Social Interest: 'affiliation', 'individuality'

Academic Motivation: 'school work', 'intrinsic motives', 'incentive'

The attitude factor 'affiliation' specifies how the students like their parents and home, whether they wish to be with their parents and at home almost all the time, how helpful parents are, and how comfortable the home is; the attitude factor 'frustration' describes how the students dislike their home and parents, and how unhappy they feel at home.

The interest factor 'affiliation' represents how the students think of friendship and how they like to be with friends; the interest factor 'individuality' shows how they dislike friends and want to be alone.

The motivation factor 'school work' indicates how the students think of school work and life as a whole; the motivation factor 'intrinsic motives' explains how they like to study for the sake of knowledge, self-satisfaction, and to gain a sense of achievement; while the motivation factor 'incentive' gives a description of the students' external objects, e.g., prizes, examination results, success, and the future.

Adams[2] (1964) pointed out that recent studies of attitude-scale construction evidence a trend towards the development of homogeneous sub-scales within the larger area. The investigator followed this trend in obtaining by factor analysis two sub-scales for 'attitude to home', two sub-scales for 'social interest', and three sub-scales for 'academic motivation' as listed above.

The items for the seven factors were scored from 1 to 5, as is usual in a Likert-type test. Many research workers prefer Likert scales to others because they can be constructed in a comparatively short time and with greater ease, and do not involve the use of judges, who themselves may be prejudiced and thus introduce an error factor in the process of item selection. This method is entirely based on empirical data regarding the students'

responses and not on the subjective opinions of the judges. This method also produces a more homogeneous scale and increases the probability of measuring a unitary attitude. Moreover, this method is simple and less time-consuming in administration as well as scoring. Hence Likert scales were used in this study.

In spite of certain weaknesses implied in the fact that equal score intervals do not allow us to assert the equality of underlying attitude differences and that identical scores may have very different meanings, the Likert scales tend to perform very well when required to give a reliable rank ordering of people with regard to a particular attitude, as pointed out by Oppenheim[3] (1966). This fits the present research purpose well, since we are interested mainly in the comparison of attitude scores rather than in the absolute values of the scores. Oppenheim further listed two other advantages of Likert scales, namely that they provide more precise information about the respondent's degree of agreement or disagreement, and they can include less obvious and more subtle items. It is believed, according to Adams[4] (1964), that an attitude scale devised to suit a specific purpose is more suitable than any of the published scales. Hence new five-point attitude scales were constructed by the investigator for his own purposes in this study.

Another technique employed here was the Sentence Completion Test in which students would have more freedom to express what they really thought about home, school, and social life, and the opportunity to give frankly their opinions on these topics. Such a projective technique is believed to be revealing and to permit greater depth and subtlety. The other advantage of giving a Sentence Completion Test (indirect method) along with the Likert-type test (direct method) is that the results of the two

methods can easily be compared or used to complement one another.

Newcomb[5] (1950) said that for intensive studies of individual attitudes, indirect methods should be combined with direct ones. He is of the opinion that when scales designed by different methods give similar results, our confidence in the validity of each method is increased. Consequently, they serve to check each other. Though indirect methods have been less popular because of the complexity and subjectivity of their scoring, a few writers like Bene[6] (1957) and others have given some valuable suggestions for scoring the sentence completion test and maintained that the results can be treated statistically and objectively.

Tendler[7](1930) was the first to devise a sentence completion test for 'emotional insight' and he pointed out that indirect methods directly evoke free emotional responses. Rohde[8] (1946) made an attempt to study personality by sentence completion methods, and noted that direct questionnaires tend to make the respondent self-conscious and put him on the defensive, usually preventing him from letting the tester know his true self. Also, the questions are often suggestive and do not allow any freedom for self-expression. In his opinion, projective techniques not only bring out the conscious attitudes but also highlight the unconscious attitudes. In view of the above considerations, the present study used the sentence completion test as well as the direct method in order to gain a better understanding of the students' attitudes. In the present investigation, the students were also asked to write a 'Composition' on their 'attitude to home'. It was felt that such an open-ended test would allow students even greater freedom of expression. The present study also used a sociometric technique to assess students' popularity in class, as explained in Chapter Five.

(d) Achievements

Four major academic areas were examined in this study, namely English, science, mathematics, and overall achievement . These four areas are generally considered by teachers and parents to be the most important. The English area comprises English Composition, General English, English Dictation, Oral English, General Reading, and English Literature; the science area includes Biology, Chemistry, and Physics; the mathematics area consists of Arithmetic, Algebra, Geometry, and Trigonometry; while overall achievement covers all the above subjects and adds Chinese, Geography, and History. Another reason for investigating these four areas of achievement was that they were believed to have close relations with the intellectual areas: verbal, non-verbal, numerical and general intelligence.

2. The Samples

In this study three samples were used: two pre-test samples and one final sample. Of the two pre-test samples, one was from Hong Kong and the other from Singapore. The sampling was based on a systematic survey of the Hong Kong school system, in part derived from the writer's own long-standing knowledge of the system as a secondary teacher and as an inspector of schools. The characteristics of the above samples are described below.

(a) Hong Kong Pre-Test Sample

The Hong Kong pre-test sample was drawn from a government-aided suburban school. It was an Anglo-Chinese mixed school, where the teaching medium is English and the students are Chinese. The academic standard of this school was considered to be about average or moderate, and the children came largely from middle-income families. There were four Form IV classes with a total of 160 students comprising 93 boys and 67 girls. The ages of

the students ranged from 14.11 to 20.0, with a mean of 17.2 (Western type of age-reckoning being used throughout, not the Chinese method). The age-range is fairly wide but is not uncommon in the Hong Kong school situation. Such a sample was considered suitable for try-out purposes as the students were judged to be representative of a reasonably medium range of the school population to be investigated more fully later.

(b) Singapore Pre-Test Sample

The Singapore pre-test sample was also drawn from a government-aided suburban school. It was again an Anglo-Chinese mixed school. This school was visited by the investigator in August 1970 through the kind help of the University of Singapore School of Education. The academic standard of this school was found to be similar to that of the Hong Kong pre-test sample. There were 140 Form IV students consisting of 67 boys and 73 girls. The ages of the students ranged from 15.0 to 17.9, with a mean of 15.4. This sample was considered to be quite similar to the Hong Kong pre-test sample, and to be suitable for present purposes since it was mainly used for establishing cross-cultural stability of the Ginsburg Parent Image Differential Test.

(c) The Main Sample

To ensure that the sample of students for the main study included a wide range of family background, a stratified random representative sample of 14 schools with the following distribution was used. It was considered that in surveys, a stratified sample would give more precise information about the population than a pure random sample, as pointed out by Dixon and Massey[9] (1969).

Table 25: DISTRIBUTION OF THE SAMPLE BY TYPE OF SCHOOL

Type	Sex and Region: Boy Urban	Girl Urban	Mixed Urban	Mixed Rural	Total	Ratio
Govt.	5 (1)	2	3	3	13 (1)	1:13
Aided	14 (1)	13 (1)	10 (1)	2	39 (3)	1:13
Priv.	11 (1)	9 (1)	104 (7)	13 (1)	137(10)	1:13.7
Total	30 (3)	24 (2)	117 (8)	18 (1)	189(14)	1:13.5
Ratio	1:10	1:12	1:14.6	1:18		

Note: 1. The figures in brackets show the numbers of schools used in the sample; the figures not in brackets refer to the total numbers of secondary schools in Hong Kong.

2. The schools in each cell are randomly selected for the sample.

3. The ratios are as close as the school frequencies would allow.

Table 26: DISTRIBUTION OF HONG KONG FORM IV STUDENTS (1970-71)

Type	Population	Sample	Percentage of Students in Sample
Govt.	2,040	155	7.6
Aided	6,346	274	4.3
Priv.	19,022	979	5.1
Total	27,408	1,408	5.1

The above student distribution is comparable to that used in the Project Talent study in the United States (Cooley,[10] 1971) where a five percent sample was also taken. It was possible, according to Cooley, to make estimates of measurement parameters for the entire population of high school youth in the United States from his five percent sample. It can therefore be claimed that the five percent sample for the present study is also representative of the Hong Kong school population at the level

of this investigation and thus conclusions derived from the findings of the sample may be considered to be reasonably representative of the situation in the total school population, and some generalizations may thus be safely but cautiously stated.

Table 27: CHARACTERISTICS OF THE HONG KONG FINAL SAMPLE

School Type	No. of Form IV classes	Boys	Girls	Total	Serial No.	Region
1. Govt. gram.	4	155	0	155	1-155	Urban
2. Aided tech.	1	50	0	50	156-205	Urban
3. Aided gram.	4	0	141	141	206-346	Urban
4. Aided gram.	2	49	34	83	347-429	Urban
5. Private gram.	3	150	0	150	430-579	Urban
6. Private gram.	1	0	50	50	580-629	Urban
7. Private gram.	1	30	11	41	630-670	Urban
8. Private gram.	3	91	36	127	671-797	Urban
9. Private gram.	2	56	22	78	798-875	Urban
10. Private gram.	1	39	17	56	876-931	Urban
11. Private gram.	4	76	76	152	932-1083	Urban
12. Private gram.	3	82	65	147	1084-1230	Urban
13. Private gram.	3	110	25	135	1231-1365	Urban
14. Private gram.	1	24	19	43	1366-1408	Rural
Total	33	912	496	1408		

The above table shows how the schools vary in size, composition and location. In the sample, three schools have four Form IV classes, four have three classes, two have two, and five have one. Thus the sample covers a very satisfactory range in terms of school size. It is to be noted that the average class size is 43 students and that the number of boys is nearly twice that of

girls, which is again reasonable since it is approximately equal to the school population ratio. It was also found that the age range was 14.3 to 21.6, with a mean of 17.0, which once more proves to be very close to the pre-test sample values.

Thought was given to the desirable school level at which the investigation could best be carried out in practice. Form IV students were used in this investigation for the following reasons: firstly, Form V is a busy year for preparation for external examination, students are engrossed in their studies, and hence schools would not like to be disturbed; secondly, the Chinese students of Forms I-III are generally more limited in their English, and are likely to find more difficulty in reading and understanding the instructions and contents of the tests to be used in this study. Preliminary enquiries and try-outs suggested this was not the case at the Form IV level.

It was considered necessary in order to make the sample truly representative that a typically wide variety of school achievements should also be represented. This was arranged and the table below shows that the present sample includes a sufficiently wide range of academic results:

Table 28: AVERAGE ACADEMIC RESULTS FOR THE YEARS 1967-70

School	English Subjects	Science Subjects	Mathematics Subjects	Overall Results
1.	91.20	87.83 (best)	89.74	88.72
2.	75.88	72.73	95.26 (best)	85.10
3.	100.00 (best)	86.79	88.55	88.88 (best)
4.	96.17	85.57	78.47	84.78
5.	90.96	74.27	92.30	82.82
6.	21.62	23.72	28.33 (worst)	25.38 (worst)
7.	32.51	34.45	60.00	41.38
8.	74.66	68.82	69.03	72.62
9.	22.24	21.69 (worst)	35.65	25.69
10.	24.44	33.16	54.64	50.25
11.	66.15	64.75	72.65	73.80
12.	52.34	64.44	69.60	64.80
13.	15.90 (worst)	31.57	36.98	35.18
14.	56.11	46.98	60.99	55.98

Note: 1. Academic results are based on the public examination --- Hong Kong Certificate of Education (English) Examination, which is taken at the end of Form V.

2. A fuller list of results is given in Appendix 10.

Summing up these various sampling issues, it can fairly be claimed that the above sample is as representative of the parent school population as the parameters would allow and that it is suitable for use in the present study.

3. The Procedures

(a) General Process

Fifteen Hong Kong schools were contacted (one for pre-test

and fourteen for final test) and the testing times were arranged with the principals or the senior masters: sessions were usually in the morning when the students were fresh and prepared to work. In general the principals, the teachers, and the students were most cooperative and expressed their willingness to help in every possible way, especially when they understood that this was for purposes of a research study. A total number of 1,708 students were involved in the investigation, including those tested in Singapore. The tests were conducted in the students' normal classrooms without undue publicity or disruption of school life. The size of the classes ranged from 35 to 56 students, and hence they were manageable by the investigator alone. The same arrangements were made for the Singapore testing as for Hong Kong.

During the administration of the tests, though the Chinese students in the sample are English-speaking, English as well as Chinese verbal explanations were given at the beginning of each test so as to ensure that every student knew exactly what he was expected to do. This was in addition to the printed English instructions on the tests. It was noted that after the briefing session, all the students proceeded to answer the items smoothly. No signs of unrest were shown in any of the classes. It was particularly gratifying to see that the students seemed to be very interested in the tests, and at the end of each testing session, some students raised questions which proved their personal interest and involvement in the tests. They also appeared to be happy to be able to change their routines from normal lessons for a time. Furthermore, students had the opportunity to express their feelings freely and there is no doubt most of them appreciated this fact. They were told that

their responses would be kept confidential and would not be disclosed to their parents, principals, teachers, classmates, or anybody else, except the tester himself, who would later change their names to code numbers and their identities would be lost after the analyses of the data. Apparently they were glad to have such an experience and some of them even asked for more such tests in future.

There were three stages of test administration, namely pre-test, main test, and retest. The pre-test sample was different from but parallel to the main test and retest samples, in order to ensure that the students in the main study would not have any previous knowledge of the tests. However, in view of the time involved, the retest sample was derived from the main sample. It consisted of 150 students but this number was considered sufficient to establish test-retest reliabilities. Also the retests were carried out after an interval of three months, which was considered to be an appropriate period for the students to forget the contents of the tests and at the same time not to have very appreciable attitude shifts. It should be pointed out that there were a few absentees at various stages of the testing process. However, the numbers were very small compared to the total and it was found that no selective factor of absenteeism existed; thus it was concluded that the results would not have been affected appreciably.

The AH4 Test booklets and the corresponding answer sheets were purchased from the National Foundation for Educational Research in England and Wales. Other tests were produced by the duplicating machine on good quality paper. The students gave their answers and opinions on the papers provided, and no extra sheets were required in the testing process, in order to avoid

unnecessary confusion and irregularity. The whole administration of the programme, including the testing procedures, ran extremely smoothly, and no particular difficulties were encountered. It should be pointed out also that the testing process in the main study was carried out personally, i.e., by the present investigator himself, and thus variation in the presentation of the test material was minimised.

(b) Specific Administration

(i) Parent-Child Interaction

The Ginsburg Parent Image Differential Test (Appendix 1) was duplicated and administered to the students. The semantic differential scales were explained to the students with examples on the instruction sheet and also on the blackboard. The test was started only when no more queries were raised by the class. The students were requested to follow the rules strictly, and were encouraged not to spend much time in thinking about any single item or scale, but to check the items rapidly, recording their first impressions. It was pointed out that it is their first impressions and immediate reactions which are important, and that each scale should be done in the required order, i.e., they should not look back and forth haphazardly through the scales. The students were also told that none of the items were repeated in the tests, although the scales for both father and mother are the same. Thirty minutes were given for this test, though the students were allowed to hand in their papers at any time when they finished.

The scores of the pre-test sample of 160 students were factor analysed to yield the major factors (as previously explained). Tables of factor loadings from Ginsburg's North American and Mexican groups were obtained in order to provide

some cross-cultural evidence (Chapter Four). In Singapore, a sample of 140 students were tested under arrangements made by the present investigator. These data were then analysed to give factor patterns which provided additional support for the use of PID Test with Hong Kong Chinese students taught in the English medium --- conditions very similar to those which apply in Singapore. The items of each of the twelve PID Test factors were scored separately for the final sample (the favourable poles having higher scores), and these scores were then correlated with other psychological variables in this study and also submitted to other statistical analyses in order to test our hypotheses.

(ii) Cognitive Aspects

The AH4 Test was applied to all the students. The procedure stated in the AH4 manual was strictly adhered to. The rules and the examples in the test were gone through with the students in Chinese as well, as as to avoid any possible misunderstanding of instructions. From two to five minutes were used to discuss the examples in each of the two parts of the test with the students. Rapport was established before the test was started, and the students were encouraged to try their best. Ten minutes were allowed for each part of this test, but at the end of ten minutes, an extra five minutes were given to allow most of the students to finish the test with another kind of pencil. As the AH4 Test is primarily a speed test, it was hoped that the extra time given would change it to a power test. It is therefore of interest to discover at some stage whether or not there is a high correlation between the scores under the two conditions.

(iii) Affective Aspects

In giving the Likert pre-test (180 items) and the final test

(89 items) to the students, the importance of answering the statements in exactly the way they think about them was stressed. It was emphasized that there are no right or wrong answers to any of the statements and that it is what they really think about the issues that matters. It was found in general that the students enjoyed this multiple-choice type of question, and it was also noted that generally they were quite serious in how they tackled their task of answering. One hour was given for the pre-test and half an hour for the final test. Scores were then obtained for the seven factors: two for "attitude to home", two for "social interest", and three for "academic motivation".

During the administration of both the Sentence Completion Test and Composition, the students were told that they were free to write down anything that came to their minds and that they were not being tested in their English grammar. It was stressed that their honest opinions would be of the utmost importance and value. Though no time limit was set for these two tests, the students were requested to work as rapidly as they could and were expected to write about half a page on the composition topic "My Family Life". In general, the tests were completed in about half an hour each. On the basis of the 160 pre-test answers, two marking schemes (one for each test) were constructed (Chapter Five) and were used for scaling the final test answers after reasonable agreement was reached with another scorer.

Turn now to the administration of the Popularity Test. The students were found to be rather excited about this test since they had not taken part in such a sociometric-type exercise before. And the fact that a stranger was present added to their interest. They were requested to write down the names of their classmates secretly on the sheet of paper provided, and

they were not required to write down their own names. It was also emphasised that all the information was required for research purposes and would be treated confidentially. There would be no reflection on any individuals and no follow-up. The students were found to be most cooperative and helpful and fulfilled the administrative requirements of this test well.

(c) Data from Schools and Teachers

The schools were asked to provide the following school examination results: (a) English sub-total or percentage, (b) science sub-total or percentage, (c) mathematics sub-total or percentage, and (d) grand total or average of all subjects. It was planned to use these results for correlating with types of parental behaviour and various cognitive abilities, as well as with the affective scores. The students were also asked to give their sex and age (or date of birth), because these two variables were to be used in the various analyses.

The teachers (in general the students' form-masters) in each of the fourteen schools under investigation in the main study were also asked to rate their respective students on five-point scales (1 = bad, 2 = below average, 3 = average, 4 = above average, 5 = good) for the following qualities: (a) verbal ability (arts subjects), (b) non-verbal ability (science subjects), (c) numerical ability (mathematics subjects), and (d) intelligence (overall brightness), (e) social interest (interest in others), (f) academic motivation (eagerness to learn), and (g) popularity. This completed the testing and the preparation of the raw data for this study.

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CHAPTER SEVEN

VALIDITIES AND RELIABILITIES OF INSTRUMENTS

From the many different ways of establishing validities and reliabilities of test instruments, the following are the methods thought suitable for the purposes of the present study.

1. Validities

(a) Parent Image Differential Test

The main criterion available for validating the Parent Image Differential (PID) Test is the construct validity indicated by the similarity of factor patterns in PID Test scores obtained in Hong Kong and in Singapore. This scrutiny is strengthened by the additional cross-cultural evidence provided by comparing the factor patterns obtained in Hong Kong with those previously obtained in North America and Mexico by Ginsburg et al.[1] (1970). These were quoted and discussed fully in Chapter Four (pp. 90 to 102).

The Singapore school described earlier was considered suitable for the present comparative purpose since it is known that this school is very similar as regards academic standing to the Hong Kong school used for validation. The Singapore students were tested by a trained and well-briefed colleague in Singapore under similar standard conditions to those employed by the investigator for the Hong Kong students, and the Singapore test papers were scored personally by the investigator. The data were factor analysed by the same method used for the other factor analyses in this study. The factor patterns of the Hong Kong group (n = 160) were compared to those of the Singapore group (n = 140). Since the educational, cultural, and family backgrounds of the Chinese students in Singapore are similar to those of Hong Kong students, it was decided that a suitable

measure of cross-cultural stability would be indicated if the factor patterns of the Hong Kong and Singapore groups were found to be similar.

Similar factors were identified by calculating Harman's coefficients of congruence among the Hong Kong and Singapore factors. Each factor of the Hong Kong study was compared with all the factors of the Singapore study, and was paired with the one with which it had the highest coefficient of congruence. The following Tables 29-31 show that similar factors appear, and two factors (the first two Hong Kong factors) have generally higher coefficients of congruence than the rest. This not only suggests that the first two Hong Kong factors are stable across cultures, but also gives further support to the selection of only the first two Hong Kong factors for further analyses. It was also found that the coefficients of congruence for the twelve factors (two for each concept) being used for the main analyses were as follows: four above 0.95, five above 0.81, and one each of 0.79, 0.78 and 0.64. Consequently, it can be considered that the factors have a rather high degree of similarity, and that cross-cultural stability, which makes use of two similar populations or samples, is satisfactorily established for the Parent Image Differential Test. A close and critical examination of each of the items of the PID Test in terms of their logical relevance to the current purpose and their de facto content also provided an acceptably high reassurance of the content validity of the test. This logical scrutiny procedure is described fully in Lindquist's[2] (ed) Educational Measurement (1961).

Table 29: COEFFICIENTS OF CONGRUENCE

AMONG HONG KONG AND SINGAPORE FACTORS IN "TREATED"

Father Treated

		Sing. Factors 1 (30%) concerned	2 (16%) restricted	3 (8%)	4 (6%)	5 (6%)
H.K. Factors	1 (31%) concerned	<u>0.82</u>	-0.16	-0.36	-0.36	0.21
	2 (13%) restricted	0.18	<u>0.81</u>	-0.24	-0.50	-0.08
	3 (8%)	-0.40	-0.37	0.88	0.36	-0.16
	4 (7%)	-0.76	-0.09	0.31	0.67	-0.41
	5 (6%)	0.54	0.04	-0.12	0.24	0.79

Mother Treated

		Sing. Factors 1 (35%) concerned	4 (6%) restricted	3 (7%)	5 (5%)	2 (15%)
H.K. Factors	1 (29%) concerned	<u>0.96</u>	0.29	0.63	0.43	0.14
	2 (12%) restricted	0.29	<u>0.78</u>	0.36	0.40	0.68
	3 (9%)	-0.27	-0.41	0.02	-0.06	0.03
	4 (7%)	0.53	0.48	0.57	0.89	0.37
	5 (6%)	-0.03	0.06	0.08	0.27	0.75

Note: 1. Percentage of total variance is given in brackets.

2. The coefficients of congruence of the factors to be studied are underlined.

3. Numbering of factors indicates order of extraction.

Table 30: COEFFICIENTS OF CONGRUENCE

AMONG HONG KONG AND SINGAPORE FACTORS IN "TAUGHT"

Father Taught

Sing. Factors

		1 (26°/o) democratic	2 (15°/o) demanding	5 (6°/o)	3 (11°/o)	4 (8°/o)
H.K. Factors	1 (31°/o) democratic	0.95	-0.11	0.11	0.13	-0.26
	2 (15°/o) demanding	-0.32	0.79	-0.31	-0.35	0.15
	3 (9°/o)	0.21	-0.67	0.64	0.28	0.02
	4 (7°/o)	-0.01	-0.17	-0.39	0.63	-0.62
	5 (6°/o)	-0.51	0.36	-0.08	0.10	0.35

Mother Taught

Sing. Factors

		1 (26°/o) democratic	2 (15°/o) demanding	5 (7°/o)	4 (8°/o)	3 (9°/o)
H.K. Factors	1 (28°/o) democratic	0.86	-0.03	-0.48	0.10	-0.56
	2 (13°/o) demanding	-0.37	0.64	0.62	-0.25	0.61
	3 (8°/o)	0.04	-0.56	-0.21	0.00	-0.07
	4 (8°/o)	-0.01	-0.19	-0.10	0.82	0.15
	5 (7°/o)	-0.30	0.15	-0.14	0.09	0.36

Note: 1. Percentage of total variance is given in brackets.

2. The coefficients of congruence of the factors to be studied are underlined.

3. Numbering of factors indicates order of extraction.

Table 31: COEFFICIENTS OF CONGRUENCE

AMONG HONG KONG AND SINGAPORE FACTORS IN "DISCIPLINED"

Father Disciplined

		Sing. Factors				
		1 (22%) autocratic	2 (19%) rational	5 (6%)	3 (8%)	4 (8%)
H.K. Factors	1 (35%) autocratic	<u>0.96</u>	0.05	-0.16	-0.48	-0.07
	2 (16%) rational	0.12	<u>0.82</u>	-0.52	-0.48	-0.21
	3 (7%)	-0.09	-0.23	0.50	0.09	0.28
	4 (7%)	-0.34	-0.31	0.19	0.83	0.27
	5 (6%)	0.13	-0.48	0.68	0.33	0.40

Mother Disciplined

		Sing. Factors				
		2 (14%) rational	1 (28%) autocratic	5 (7%)	3 (9%)	4 (7%)
H.K. Factors	1 (33%) rational	<u>0.88</u>	-0.40	-0.11	-0.40	0.31
	2 (13%) autocratic	-0.33	<u>0.96</u>	0.21	0.28	-0.21
	3 (8%)	-0.16	0.33	0.85	0.48	-0.12
	4 (7%)	0.21	-0.13	-0.07	-0.75	0.13
	5 (6%)	-0.67	0.33	0.25	0.31	-0.49

Note: 1. Percentage of total variance is given in brackets.

2. The coefficients of congruence of the factors to be studied are underlined.

3. Numbering of factors indicates order of extraction.

In addition to what has already been pointed out, the above tables show that nine of the twelve factors used for further analyses had the same relative importance in both Hong Kong and Singapore groups as indicated by the percentage of total variance they account for. It is of interest to note that whilst in terms of the Hong Kong data, the maternal 'rational' factor is more important than the 'autocratic' factor, the reverse is true for Singapore. Table 32 below gives items with loadings equal to or above 0.4 among the important factors for Singapore and they are comparable to those for Hong Kong (Tables 7-8, pp. 85-86).

Table 32: FACTORS AND ITEMS FOR SINGAPORE GROUP

	Father		Mother
Treated			
Factor I	15, 7,13, 8,12, 1, 9	Factor I	15,12,13, 1, 7, 9, 8
Factor II	6, 2, 3, 4	Factor IV	2, 4, 8
Taught			
Factor I	11, 6, 4,10, 1,12	Factor I	6, 1, 4,11
Factor II	9, 8, 5	Factor II	5, 8, 9,13
Disciplined			
Factor I	1, 6, 2,10,12	Factor I	2,12, 6, 1,10, 4
Factor II	3,11, 8	Factor II	8,15,14,11, 3

Note: The numerals identify those items with loadings ≥ 0.40 on the specified factor, and they are arranged in decreasing order of loadings.

(b) AH4 Test

Though the AH4 Test is a well-established test in England and has been used in many overseas countries with success, it has hardly been used in Hong Kong and there is no measure of its validity in the East. Its validity was established for present

purposes in Hong Kong by correlating the scores with school results considered as external criteria, i.e., verbal, numerical, verbal+numerical, non-verbal, and total AH4 scores were correlated with English, science, and mathematics subtotals, and with the grand total of all the school subjects. Correlations were also obtained with the corresponding teachers' ratings. It was found that the correlation coefficients of the verbal, numerical and verbal+numerical parts and total test are reasonable, varying between 0.30 and 0.64, though the coefficients of the non-verbal part are lower (Table 33). Heim, in her AH4 manual, claimed a correlation coefficient of 0.63 when comparing AH4 total scores with examination results, but no results of separate parts of the AH4 Test were quoted. The correlation between non-verbal ability and academic success was expected to be lower and for Hong Kong this is especially likely to be true. The secondary schools in Hong Kong are highly academic and, since education is not compulsory, the students are a highly select group. Furthermore, education in Hong Kong has a strong language or verbal orientation and thus for these students non-verbal ability is less important for success in the academic subjects.

As stated before, the AH4 test was administered in circumstances which allowed power test scores and speed test scores to be derived. The findings for both these scores were similar (Table 33). Moreover the correlations between the corresponding speed and power parts are very high, i.e., ranging from 0.86-0.90, except the non-verbal one which is 0.74 (Table 34). This indicates that either test score, i.e., speed or power, will serve our purposes. It was decided to use the speed test results because in general they give higher correlations with academic results (Table 33).

Table 33: CORRELATIONS OF AH4 SCORES WITH ACADEMIC RESULTS

(n = 155)

AH4	English	Science	Mathematics	Overall Achievement
Verbal (speed)	0.46	0.55	0.45	0.59
Numerical (speed)	0.40	0.47	0.48	0.54
Verb.+Num. (speed)	0.47	0.55	0.50	0.61
Verbal (power)	0.54	0.52	0.50	0.64
Numerical (power)	0.30	0.31	0.42	0.42
Verb.+Num. (power)	0.45	0.45	0.53	0.58
Non-Verb. (speed)	0.12	0.19	0.14	0.17
Non-Verb. (power)	0.04	0.02	0.05	0.03
Total (speed)	0.37	0.49	0.42	0.51
Total (power)	0.35	0.35	0.40	0.44

Table 34: INTERCORRELATIONS OF COGNITIVE ABILITIES

(n = 1392)

	Verb. (speed)	Num. (speed)	Verb. +Num. (speed)	Verb. (power)	Num. (power)	Verb. +Num. (power)	Non-Verb. (speed)	Non-Verb. (power)	Total (speed)	Total (power)
Verb. (speed)	1.00									
Num. (speed)	0.74	1.00								
Verb.+Num. (speed)	0.92	0.94	1.00							
Verb. (power)	<u>0.86</u>	0.69	0.82	1.00						
Num. (power)	0.66	<u>0.89</u>	0.83	0.72	1.00					
Verb.+Num. (power)	0.79	0.87	<u>0.89</u>	0.89	0.93	1.00				
Non-Verb. (speed)	0.55	0.57	0.60	0.61	0.64	0.68	1.00			
Non-Verb. (power)	0.37	0.47	0.45	0.42	0.50	0.50	<u>0.74</u>	1.00		
Total (speed)	0.81	0.83	0.88	0.79	0.82	0.87	0.90	0.68	1.00	
Total (power)	0.70	0.81	0.81	0.80	0.86	0.91	0.81	0.80	<u>0.90</u>	1.00

Note: The correlation coefficients of the corresponding parts of speed and power tests are underlined.

The teachers' ratings of the students' various intellectual abilities were found to have fair but significant correlations with the verbal, numerical and total AH4 scores, varying from 0.37 to 0.42, though those with the non-verbal test were again lower (Table 35). In view of the Hong Kong situation: big classes (45-55 students per class), the heavy teaching time-table (90 percent of the school time is used for teaching), and the fact that the teachers do not normally have much extra contact with the students after lessons, the teachers' ratings are almost exclusively based on limited classroom teaching contacts with the individual students, hence the ratings could not be expected to have great objective accuracy. Under these circumstances, the correlation coefficients obtained in this study could be considered satisfactory and to give some additional support to the validity of the AH4 Test for Hong Kong.

Table 35: CORRELATIONS OF AH4 SCORES WITH TEACHERS' RATINGS

(n = 1246)

Verbal (speed)	0.37
Numerical (speed)	0.39
Verbal (power)	0.40
Numerical (power)	0.42
Non-Verbal (speed)	0.30
Non-Verbal (power)	0.20
Total (speed)	0.41
Total (power)	0.39

Content validity is also applicable to the AH4 Test as a whole and to its parts, since what the test measures is indicated by the manifest content of the items: verbal (words), numerical (numbers), and non-verbal (pictures). Further support for the use of the AH4 Test as a measure of general ability in Hong Kong in the present investigation includes the approximate normality

of the distributions of scores (Appendix 12), and the field observation that the students did not experience marked difficulties in responding to the items.

(c) Likert-Type Test

It is seldom that any satisfactory evidence of the validity of attitude scales is available, other than the differentiation between groups of people known to differ in their attitudes. Oppenheim[3] (1966) also pointed out that there is a great difficulty in validating attitude scales because of their abstract nature and because of the absence of suitable criteria. The only external criterion available in this case is teachers' ratings, which, for the reasons outlined in the discussion of the AH4 Test, must necessarily have limited powers of discrimination. The restriction of teacher-student contact is of particular importance in the assessment of the qualities of attitude, interest, and motivation, as these require close personal relations between teachers and students. Such assessments are far more difficult than those of the students' academic abilities, and are liable to much greater subjectivity. No objective tests for these affective qualities had previously been used among Hong Kong students. Only ratings of the students' social interest and academic motivation were used, since it was believed that the teachers' ideas of how the students think of their homes would be even more vague. It was found that while the correlations of the teachers' ratings with the three motivation factors of the Likert Test ranged from 0.24 to 0.34, there was very little or no correlation, i.e., below 0.1 with the two interest factors of the Likert Test.

The correlations of teachers' ratings and the interest and the motivation parts of the Sentence Completion Test yielded no better results than those obtained on the Likert Test material.

However, the Composition Test for attitude could be considered a better criterion, and correlation coefficients of 0.44-0.55 between this and the Likert Test and Sentence Completion Test proved to be much higher (Table 36). Furthermore, the correlations of 0.34 to 0.72 between the corresponding totals of the Likert and Sentence Completion Tests used for checking one another seemed to suggest that they were measuring the same dimensions. This appeared to be particularly true in the case of the attitude section of the tests (Table 37). The items and scales of the Likert and the Sentence Completion Tests are rather obvious indices of the areas they are supposed to measure, even allowing for Lindquist's cautions with regard to this procedure (Lindquist,[4] 1961); content validity would therefore appear applicable as in many other studies of the same or similar nature.

Table 36: CORRELATIONS OF COMPOSITION TEST WITH ATTITUDE TESTS

(n = 1408)

Likert Test (Attitude to Home)	
Factor I - Affiliation	0.54
Factor II - Frustration	0.44
Total	0.55
Sentence Completion Test	
Attitude to Home	0.52

Table 37: CORRELATIONS OF SENTENCE COMPLETION TEST WITH LIKERT TEST

(n = 147)

Likert Test		
Attitude to Home	Factor I - Affiliation	0.70
	Factor II - Frustration	0.58
	Total	0.72
Social Interest	Factor I - Affiliation	0.34
	Factor II - Individuality	0.13
	Total	0.34
Academic Motivation	Factor I - School work	0.38
	Factor II - Intrinsic Motives	0.21
	FactorIII - Incentive	0.25
	Total	0.40

(d) Popularity Test

For the popularity test, the only external criterion available is the teachers' ratings. Once again the reasons for the low correlations of teachers' ratings with AH4, Attitude, Interest, and Motivation Tests would apply; moreover, the teachers and students see popularity from different points of view. Hence one could not expect a high correlation between the teachers' ratings and popularity test scores. In fact, a correlation of 0.28 was found in the present study. It should be pointed out that a sociometric test is mainly concerned with eliciting actual behaviours rather than inferring certain characteristics from those behaviours as in the more traditional type of psychometric tests. It seems that no external criterion is needed, and as long as the test fulfils the function of eliciting the behaviour being studied, it can be said to be a valid measure of that particular behaviour -- and we may refer to Moreno[5] (1934) and others regarding this issue. Since the two questions in the popularity test are explicit in themselves, content validity may be claimed

here. It was also noted that the correlation between the two parts of the popularity test (i.e., Favourable and Unfavourable) is -0.33. Though this is lower than expected, it is significant, and indicates that the two measures are to some extent tapping the same dimension . Hence it seems appropriate also to combine the two scores at some stage for comparison purposes in the present investigation.

2. Reliabilities

(a) Parent Image Differential Test

For each of the six concepts of the PID Test, Hoyt reliabilities were calculated by use of the formula:

$$r_{tt} = \frac{Ve - Vr}{Ve},$$

where Vr = variance ratio of remainder (error or residual variance)

Ve = variance ratio of examinees

Residual variance = total variance - variance of examinees - variance of items.

This technique provides an index of internal consistency and takes account of the error variance. The Hoyt reliability coefficients were all found to be above 0.60 (Table 38). Factor patterns of the PID Test for the test and retest of a sample of 148 students were compared by the same method as in Section 1 of this chapter to discover whether similar patterns would appear, i.e., whether the factors under investigation were stable. It was found from the comparison of the test-retest factor analyses, the coefficients of congruence for the twelve factors (first two for each of the six concepts) were all fairly high: seven above 0.81, four above 0.70, except one which was 0.51 (Table 40-42). This would appear to indicate that the first two factors of the six concepts are in general very stable over a

period of time, though the relative importance of the factors fluctuates in some cases as shown by the percentage of total variance which they account for. Furthermore, the Hoyt reliabilities of the twelve factors used for further investigation were found to be reasonable, mostly above 057, though as expected, the factors with fewer items were discovered to have lower coefficients, i.e., around 0.4 (Table 39). Consequently, it can be claimed that the PID Test is a fairly reliable test as a whole or in terms of its twelve main factors. For testing hypotheses in the present study, the items showing the highest loadings in the final factor analysis -- namely those with loadings of 0.3 and over on any factor -- were scored as a measure of that factor (Table 43-44).

Table 38: HOYT RELIABILITIES OF THE PID TEST

	Pilot Study (n = 160)	Main Study (n = 1408)
Father Treated	0.64	0.71
Mother Treated	0.68	0.73
Father Taught	0.71	0.60
Mother Taught	0.66	0.62
Father Disciplined	0.76	0.62
Mother Disciplined	0.72	0.67

Table 39: HOYT RELIABILITIES OF THE PID FACTORS

(n = 1408)

Father Treated:	I (concerned)	---	0.70
	II (restricted)	---	0.40
Mother Treated:	I (concerned)	---	0.67
	II (restricted)	---	0.37
Father Taught:	I (democratic)	---	0.63
	II (demanding)	---	0.36
Mother Taught:	I (democratic)	---	0.69
	II (demanding)	---	0.45
Father Disciplined:	I (autocratic)	---	0.57
	II (rational)	---	0.60
Mother Disciplined:	I (rational)	---	0.62
	II (autocratic)	---	0.59

Table 40: COEFFICIENTS OF CONGRUENCE

AMONG HONG KONG TEST-RETEST FACTORS IN "TREATED"

Father Treated

H.K. Retest

		1 (31%) concerned	2 (10%) restricted	3 (8%)	4 (8%)	5 (6%)
H.K. Test	1 (32%) concerned	<u>0.89</u>	0.47	0.55	-0.02	-0.22
	2 (13%) restricted	0.21	<u>0.82</u>	0.31	0.45	-0.41
	3 (9%)	0.54	0.58	0.56	-0.45	-0.10
	4 (8%)	0.63	0.21	0.09	0.25	-0.14
	5 (6%)	-0.43	-0.37	0.72	-0.16	0.52

Mother Treated

H.K. Retest

		4 (7%) concerned	3 (9%) restricted	1 (28%)	2 (12%)	5 (7%)
H.K. Test	1 (31%) concerned	<u>0.77</u>	0.36	0.46	-0.57	0.72
	2 (11%) restricted	0.15	<u>0.82</u>	0.33	-0.54	0.61
	3 (9%)	0.10	0.17	0.58	0.06	0.19
	4 (6%)	-0.23	0.85	-0.52	0.19	-0.04
	5 (6%)	-0.18	0.12	-0.01	0.42	0.14

Note: 1. Percentage of total variance is given in brackets.

2. The coefficients of congruence of the factors to be studied are underlined.

3. Numbering of factors indicates order of extraction.

Table 41: COEFFICIENTS OF CONGRUENCE

AMONG HONG KONG TEST-RETEST FACTORS IN "TAUGHT"

Father Taught

H.K. Retest

		1 (26°/o) democratic	5 (7°/o) demanding	3 (10°/o)	2 (11°/o)	4 (8°/o)
H.K. Test	1 (32°/o) democratic	0.88	-0.35	-0.03	-0.21	-0.13
	2 (14°/o) demanding	-0.10	0.51	0.44	0.40	0.11
	3 (10°/o)	-0.05	0.24	0.53	0.24	-0.52
	4 (7°/o)	-0.56	0.37	-0.03	0.42	-0.11
	5 (6°/o)	-0.04	0.26	0.12	0.48	0.69

Mother Taught

H.K. Retest

		1 (25°/o) democratic	3 (9°/o) demanding	2 (12°/o)	5 (8°/o)	4 (8°/o)
H.K. Test	1 (28°/o) democratic	0.81	-0.61	-0.12	0.00	0.26
	2 (13°/o) demanding	-0.19	0.70	-0.56	-0.03	-0.29
	3 (8°/o)	-0.32	-0.24	0.34	0.28	0.20
	4 (8°/o)	0.13	0.07	0.34	0.78	0.23
	5 (7°/o)	-0.51	0.06	-0.07	0.47	-0.17

Note: 1. Percentage of total variance is given in brackets.

2. The coefficients of congruence of the factors to be studied are underlined.

3. Numbering of factors indicates order of extraction.

Table 42: COEFFICIENTS OF CONGRUENCE

AMONG HONG KONG TEST-RETEST FACTORS IN "DISCIPLINED"

Father Disciplined

H.K. Retest

		5 (7°/o) autocratic	2 (11°/o) rational	3 (9°/o)	4 (8°/o)	1 (24°/o)
H.K. Test	1 (38°/o) autocratic	0.81	-0.17	-0.35	0.19	-0.59
	2 (15°/o) rational	-0.27	0.78	0.37	-0.28	0.28
	3 (6°/o)	-0.10	0.20	0.62	-0.42	0.07
	4 (6°/o)	0.25	-0.13	-0.36	0.44	0.03
	5 (6°/o)	-0.32	0.43	0.39	0.18	0.18

Mother Disciplined

H.K. Retest

		1 (21°/o) autocratic	2 (14°/o) rational	5 (7°/o)	3 (9°/o)	4 (7°/o)
H.K. Test	1 (34°/o) autocratic	0.73	-0.29	-0.18	-0.33	0.73
	2 (13°/o) rational	-0.30	0.85	0.06	0.29	-0.23
	3 (8°/o)	-0.22	-0.10	0.42	0.57	-0.08
	4 (7°/o)	-0.10	0.24	-0.01	0.77	-0.17
	5 (7°/o)	-0.46	0.39	0.23	0.20	-0.00

Note: 1. Percentage of total variance is given in brackets.

2. The coefficients of congruence of the factors to be studied are underlined.

3. Numbering of factors indicates order of extraction.

Table 43: FATHER FACTORS AND ITEMS USED IN THE FINAL ANALYSES (n = 1408)

Father

Treated

Factor: Concerned (24°/o variance)

Item		Loading
12	(encouraging)	0.68
15	(close)	0.67
13	(concerned)	0.66
7	(skilful)	0.61
1	(warm)	0.59
9	(just)	0.52

Factor: Restricted (9°/o variance)

Item		Loading
2	(stern)	0.78
4	(hard)	0.53
6	(severe)	0.48

Taught

Factor: Democratic (21°/o variance)

Item		Loading
4	(skilful)	0.73
11	(understood)	0.73
1	(often discussed)	0.70
6	(together)	0.69
14	(pleased on my own)	0.55
12	(patient)	0.41
2	(encouraging)	0.41
7	(difficult to irritate)	0.31

Factor: Demanding (12°/o variance)

Item		Loading
5	(stern)	0.63
8	(tense)	0.62
9	(hard)	0.51
13	(criticizing)	0.49

Disciplined

Factor: Autocratic (19°/o variance)

Item		Loading
2	(hard)	0.81
1	(punished often)	0.77
10	(stern)	0.76
6	(severe)	0.62
12	(strict)	0.49

Factor: Rational (11°/o variance)

Item		Loading
11	(reasonable)	0.75
3	(punishment explained)	0.72
15	(blame self)	0.55
14	(be with family)	0.54
4	(persuasive)	0.46
8	(guilty)	0.32

Note: 1. Items with loadings of 0.3 and above from the Final Test are included in each factor.

2. The "autocratic" factor is more important in father than mother.

Table 44: MOTHER FACTORS AND ITEMS USED IN THE FINAL ANALYSES
(n = 1408)

Mother — Treated

Factor: Concerned (25°/o variance)

Item		Loading
10	(reasonable)	0.77
9	(just)	0.65
7	(skilful)	0.52
12	(encouraging)	0.40
11	(consistent)	0.37
4	(skilful)	0.37
8	(sensitive)	0.35

Factor: Restricted (7°/o variance)

Item		Loading
2	(stern)	0.70
6	(severe)	0.70
13	(indifferent)	0.32

Taught

Factor: Democratic (21°/o variance)

Item		Loading
4	(skilful)	0.75
11	(understood)	0.75
1	(often discussed)	0.72
6	(together)	0.69
14	(pleased on my own)	0.51
12	(patient)	0.43

Factor: Demanding (12°/o variance)

Item		Loading
5	(stern)	0.75
8	(tense)	0.57
9	(hard)	0.42
13	(criticizing)	0.42

Disciplined

Factor: Rational (20°/o variance)

Item		Loading
3	(punishment explained)	0.73
11	(reasonable)	0.71
14	(be with family)	0.62
9	(know the rules)	0.47
4	(persuasive)	0.44
15	(blame self)	0.34

Factor: Autocratic (11°/o variance)

Item		Loading
1	(punished often)	0.78
2	(hard)	0.71
5	(angry when punishing)	0.62
12	(strict)	0.56

Note: 1. Items with loadings of 0.3 and above from the Final Test are included in each factor.

2. The "rational" factor is more important in mother than father.

(b) AH4 Test

Test-retest reliabilities of the AH4 Test, when used as a speed test or as a power test, were all found to be above 0.60 (Table 45). The highest correlation obtained for the data was 0.80 for the total speed test scores, compared to 0.92 claimed by Heim in her AH4 manual. Hoyt reliabilities of the AH4 Test were found all considerably higher than test-retest results, ranging from 0.73 to 0.91. Hence it can be said that the AH4 Test as a whole, and its parts, are sufficiently reliable for the present purposes.

Table 45: RELIABILITIES OF AH4 TEST

	Test-Retest (n = 150)		Hoyt (n = 160)
	Speed	Power	Power
Verbal	0.61	0.60	0.73
Non-Verbal	0.77	0.61	0.87
Numerical	0.63	0.66	0.82
Verbal+Numerical	0.66	0.69	0.87
Total	0.80	0.76	0.91

(c) Likert-Type Test

Likert[6] (1932) reported split-half reliability coefficients of 0.79 to 0.91 with his data. In this study it was considered that the test format was not suitable for giving comparable halves and it was felt that stability in a time-wise sense appeared to be appropriate in terms of the material. The test-retest reliabilities of eight of the ten Likert-type test scales were found to range from 0.61 to 0.85, while two were 0.48 and 0.43 (Table 46). Such results may be regarded as satisfactory, especially when one considers the shortness of some of the scales -- some having less than 12 items.

Table 46: TEST-RETEST RELIABILITIES OF LIKERT TEST

(n = 147)

Attitude to Home:	Affiliation	0.85
	Frustration	0.79
Social Interest:	Affiliation	0.68
	Individuality	0.48
Academic Motivation:	School Work	0.61
	Intrinsic Motives	0.43
	Incentive	0.64
Attitude (total)		0.87
Interest (total)		0.69
Motivation (total)		0.69

(d) Sentence Completion Test

Test-retest reliabilities of the Sentence Completion Test ranged from 0.55 to 0.79, whereas Hoyt reliabilities were higher in value, i.e., from 0.59 to 0.83. Inter-scorer reliabilities were found to be very high, from 0.86 to 0.94 (Table 47). This indicates that there was high agreement between the two scorers in the marking of the items.

Table 47: RELIABILITIES OF SENTENCE COMPLETION TEST

	Test-Retest (n = 148)	Hoyt	Inter-scorer
Attitude	0.79	0.83	0.94
Interest	0.55	0.59	0.86
Motivation	0.55	0.66	0.88

(e) Composition Test

Test-retest reliability was found to be 0.37 (n = 147). This is not unexpected for what may be considered as a one-item test. Inter-scorer reliability was found to be quite reasonable at 0.61. This result may be considered to accord with the well-known fact that the assessment of essay type questions tends to show a good

deal of subjectivity.

(f) Popularity Test

Test-retest reliabilities were found to be 0.72, 0.89, and 0.87 (n = 148) respectively for the Favourable, Unfavourable, and Combined Popularity scores (i.e., Favourable - Unfavourable scores). This is satisfactory since it suggests rather clearly that the students were consistent in giving their likes and dislikes.

(g) Teachers' Ratings

Inter-rater reliabilities were found to be in general very high, ranging from 0.88 to 0.99 except for two which were 0.60 and 0.69 (Table 48). This suggests that teachers tend to rate their students by similar standards and have similar knowledge of their students' abilities and other qualities. However, since some of the coefficients are suspiciously high, it might have been that the two teachers consulted each other before rating the students' characteristics, particularly their interest, motivation, and popularity.

Table 48: INTER-RATER RELIABILITIES
(n = 135)

Verbal	0.60
Non-Verbal	0.69
Numerical	0.92
Intelligence	0.88
Interest	0.93
Motivation	0.98
Popularity	0.99

Summing up the results of validities and reliabilities of all the tests used in this investigation, as interpreted in this chapter, it can be concluded that as a whole the various instruments are reasonably valid and also reasonably reliable and that the use of these tests in the main study appears justified.

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CHAPTER EIGHT

TEST OF HYPOTHESES

The validities and reliabilities of the test instruments employed in this study having been established, the present chapter moves on to test the hypotheses set down in Chapter Three. A number of experimental designs and analytical methods were used for this purpose, and their selection was governed by the particular hypotheses involved and also by the nature of the data itself, as illustrated below.

1. Methods of Analysis

The main statistical methods employed were correlation, factor analysis, analyses of variance and of covariance, and certain stepwise regression techniques.

Pearson's product-moment correlation was used, it being considered the most reliable and sensitive of all correlation procedures, since it takes full account of all individual differences. This method has proved to be particularly useful where the data consist of series of continuous variables and in cases where the distributions are reasonably normal.

The factor analysis technique used was the principal components method followed by varimax rotation. This method was considered appropriate as it identifies the chief independent dimensions among the various continuous variables. The principal components solution is regarded as the most desirable way by which the initial factor structure of a correlation matrix may be obtained in circumstances such as the present, whether or not subsequent rotation is desired (Harman[1], 1967). Fruchter[2] (1954) also pointed out that by this method, each factor extracts the maximum amount of variance, i.e., the sum of squares of factor loadings is maximized on each factor. Thus the correlation matrix is

condensed into the smallest number of orthogonal factors. Both Kaiser[3] (1960) and Harman[4] (1967) recommended using those factors whose latent roots are greater than one. Since this rule applies only if unities are used in the diagonal, it gives one of the reasons for beginning with unity as the communality estimate, as pointed out by Cooley and Lohnes[5] (1962). The present study adopted this criterion of Kaiser for factor selection. As for rotation, the varimax criterion, also developed by Kaiser[6] (1958), was used since for each factor, varimax rotation tends to yield high loadings for a few variables and the rest of the loadings on the factor are either zero or near-zero. Hence the present study used varimax rotation to determine the variables with high loadings for the important orthogonal factors.

Analyses of variance and covariance are used wherever the data divide logically into distinct categories, e.g., boy and girl, father and mother, and different schools. Multivariate analyses are also used where suitable to show the separate and combined effects of two or more measures of psychological attributes such as intelligence, attitude, interest, motivation, or popularity in this study. Such designs also reduce the number of analyses for the same information. In the present study, it was found that nearly all the scores of the single and composite variables approximated to normal distribution (Appendices 11-15). Both univariate and multivariate F ratios were obtained for comparison purposes.

Strictly speaking, to comply with the requirements of the Theory of Analysis of Variance, the variances within the samples to be compared should be equal within the limits of sampling error. Some writers consider a test of homogeneity of variance desirable when it is possible to carry it out. There are tests

like Hartley's F max and Bartlett's chi square which are available for this purpose. However, Winer[7] (1970) pointed out that "F tests are robust with respect to departure from homogeneity of variance" and "the above tests are over-sensitive to departures from normality of the distributions of the basic observations". Hence the present study did not attempt to test homogeneity of variance, since there were no grounds for suspecting gross heterogeneity, or serious departures from normality. As regards analysis of covariance, the assumptions underlying the analysis of variance also apply. In connection with this, Winer[8] (1970) stated that "evidence from the usual analysis of variance indicates that F tests in the analysis of covariance are robust with respect to the violation of the two assumptions, normality and homogeneity of the residual variance", but "the effect of nonhomogeneity of within-class regression, which is analogous to lack of additivity, has not been studied"; though Ferguson[9] (1966) wrote that "for certain purposes it may be a matter of interest to test the hypothesis that the slopes of the regression lines within the K (experimental) groups are the same". Hence, for our limited purposes, the above assumptions were made in this study.

Stepwise multiple regression analysis was used to find regression models for cognitive abilities, attitude, interest, motivation, and popularity on the twelve types of parental behaviour identified in this study. Achievement was regressed on parental variables and also along with all other variables. The stepwise technique allows the identification of the most significant variables; it minimises the number of independent predictors and maximises the value of R. The relative importance of the independent variables in the regression equation is

determined by the calculation of R^2, first for the independent variable that offers most in prediction of the criterion, then for the independent variables in order one and two that offer most in prediction when combined, then for the independent variables one, two and three, and so on. The analysis terminates when the increment in R^2 brought about by adding a new variable fails to reach statistical significance or when the final R^2 is not appreciably larger than the previous one. Ferguson[10] (1966) stated that frequently, in practical work, the greater part of the prediction achieved can be attributed to a relatively small number of variables, perhaps four or five, and the inclusion of additional variables contributes only small and diminishing amounts. Guilford[11] (1965) also stressed that adding tests beyond the point at which all the factors that the tests measure in common with the criterion are covered, may merely contribute more error variance to the composite than anything useful. In the present study, five steps (hence five independent variables) were calculated in every case, because it was considered that this number would be appropriate for the data, as revealed by the later factor analysis tables. Hope[12] (1968) pointed out that it is quite possible for a variable to have a zero correlation with the criterion and yet for it to contribute indirectly by 'suppressing' that part of another variable which reduces the latter's correlation with the criterion. Hence the multiple regression analysis in this study was started with all variables which were stepped down till there were only five left, no matter whether they had high or low correlations with the criterion.

2. Summary of Hypotheses

The hypotheses derived and enumerated in Chapter Three can be conveniently summarised into four main overall hypotheses as follows:

Hypothesis I:

There are significant relationships between parental behaviour, and children's verbal, numerical, non-verbal, overall general intelligence, attitude, interest, motivation, popularity, and achievement.

Hypothesis II:

There are significant differences between boys and girls in cognitive and affective attributes, and achievement.

Hypothesis III:

There are significant differences between paternal and maternal behaviour towards their children.

Hypothesis IV:

There are significant between-school differences for the various cognitive and affective attributes of students.

3. Test of Hypothesis I

To test this hypothesis, a correlation matrix of the following variables was constructed, since all the variables were found to show reasonably normal distributions. Small exceptions were that the non-verbal ability result is somewhat negatively skewed, and the popularity and unpopularity variables are somewhat positively skewed (Appendices 11-15). It should be noted again that throughout the study, the favourable pole of all variables (except unpopularity) has higher scores, e.g., a high score for 'father restricted' factor means less paternal restriction.

Table 49: MAXIMUM SCORE, RANGE, MEAN, AND STANDARD DEVIATION OF ALL VARIABLES (EXCLUDING ACHIEVEMENT)

Variables	Max. Score	Range	Mean	S.D.
1 = Age (in months)	258	171-258	204	12.66
2 = Father Concerned	42	6-42	31.18	6.04
3 = Father Restricted	21	3-21	12.82	3.36
4 = Mother Concerned	49	11-49	34.53	6.65
5 = Mother Restricted	21	3-21	13.58	3.29
6 = Father Democratic	56	11-56	35.13	7.10
7 = Father Demanding	28	4-28	15.56	3.70
8 = Mother Democratic	42	6-42	28.65	6.79
9 = Mother Demanding	28	4-28	16.46	3.95
10 = Father Autocratic	35	5-35	20.06	5.01
11 = Father Rational	42	7-42	28.69	5.56
12 = Mother Rational	42	6-42	28.03	5.73
13 = Mother Autocratic	28	4-28	16.16	4.68
14 = Attitude to Home	100	26-91	65.71	10.71
15 = Social Interest	75	23-68	48.35	6.39
16 = Academic Motivation	90	34-80	61.44	7.78
17 = Affiliation Attitude	105	26-99	68.69	11.05
18 = Frustration Attitude	55	15-55	38.36	6.31
19 = Affiliation Interest	95	36-86	65.84	6.84
20 = Individuality Interest	55	15-43	31.00	4.19
21 = School Work	55	14-55	39.66	5.96
22 = Intrinsic Motives	45	16-45	31.60	3.41
23 = Incentive	35	7-35	25.09	3.59
24 = Verbal	32	3-28	14.94	4.59
25 = Numerical	33	0-30	13.61	5.34
26 = Verbal+Numerical	65	3-59	28.51	9.28
27 = Non-Verbal	65	6-87	48.79	10.31
28 = General Intelligence	130	15-117	77.24	17.51
29 = Attitude (Composition)	5	1-5	3.20	1.19
30 = Popularity	63	0-63	11.45	7.79
31 = Unpopularity	71	0-71	9.91	10.76

The above Table 49 shows that most means and standard deviations are such as might be expected for normal distributions except those for variables 30 (popularity) and 31 (unpopularity) which are rather skewed, as commonly found in sociometric studies (Appendices 11-15).

Table 50: CORRELATION MATRIX OF ALL VARIABLES

(Excluding Achievements)
(n = 1375)

	1	2	3	4	5	6	7	8	9	10
2	-*									
3	....	**								
4	....	0.41	**							
5	....	**	0.31	0.30						
6	....	0.54	**	0.31	....					
7	....	**	0.45	....	**	**				
8	....	**	....	0.57	**	0.42	....			
9	....	*	**	0.30	0.42	....	**	**		
10	....	**	0.45	....	**	**	0.50	....	....	
11	-*	0.52	**	0.31	**	0.58	**	0.35	....	**
12	....	**	*	0.54	**	0.30	....	0.57	**	....
13	....	....	....	0.34	**	....	....	0.30	0.45	*
14	....	0.37	**	0.33	**	0.37	**	0.37	**	**
15	**	**	....	**	....	**	....	**	....	....
16	....	**	....	**	....	**	....	**	....	....
17	....	0.39	**	0.37	**	0.44	**	0.43	**	**
18	....	0.38	**	0.34	**	0.32	**	0.31	**	**
19	**	....	....	*	....	**	....	**	....	....
20	....	....	....	....	....	....	....	....	....	*
21	-*	**	....	*	....	*	....	....	....	....
22	....	**	....	**	**	....	....	....	....	....
23	-**	**	**	**	**	**	....	**	....	*
24	-**	**	**	*	**	....	....	....	**	....
25	-0.31	**	**	....	**	-*	....	....	....	....
26	-0.31	**	**	....	**	-*	....	-*	*	....
27	-**	**	*	....	**	....	....	....	....	....
28	-0.39	**	**	....	**	....	....	....	*	....
29	....	**	*	**	....	0.33	....	0.32	....	**
30	....	**	*	*	**	....	....	....	....	**
31	....	....	....	....	....	....	....	....	....	....

Note: 1. Coefficients sig. at 5°/o are indicated by *, at 1°/o by **, and coefficients ≥0.30 are specified.

2. A fuller table is given in Appendix 16.

3. The underlined figures are correlations ≥0.30 of attitude variables with parental variables.

Table 51: CORRELATION MATRIX OF ALL VARIABLES (EXCLUDING ACHIEVEMENTS) (CONT'D)

	11	12	13	14	15	16	17	18	19	20
12	0.40									
13	....	0.34								
14	0.39	0.39	**							
15	**	**	*	**						
16	**	**	*	0.42	0.35					
17	0.45	0.43	**	0.66	**	0.30				
18	0.38	0.35	**	0.56	**	**	0.64			
19	**	....	....	....	0.30	*	*	....		
20	....	....	....	**	**	**	*	**	**	
21	**	*	....	**	**	**	**	**	....	**
22	*	**	....	**	....	**	**	**	**	-*
23	**	**	....	**	**	0.44	**	0.30	**	....
24	....	....	-*	....	-**	....	....	**	....	....
25	....	....	-**	....	-**	....	....	**	....	....
26	....	....	-**	....	-**	....	....	**	....	....
27	....	....	-**	....	-**	....	....	**	....	....
28	....	....	-**	....	-**	....	....	**	....	....
29	0.31	0.30	**	0.54	**	**	0.54	0.44	....	*
30	....	....	....	*	....	*	....	**	....	....
31	....	....	....	....	....	-*	....	....	....	....

	21	22	23	24	25	26	27	28	29	30
22	**									
23	0.31	0.42								
24	**	**	**							
25	**	**	**	0.74						
26	**	**	**	0.92	0.94					
27	....	*	**	0.55	0.57	0.60				
28	**	**	**	0.81	0.84	0.88	0.90			
29	....	....	**	....	....	....	....	....		
30	**	**	**	**	**	**	**	**	....	
31	....	....	....	*	*	*	....	*	....	-**

Note: 1. Coefficients sig. at 5°/o are indicated by *, at 1°/o by **, and coefficients ≠0.30 are specified.

2. A fuller table is given in Appendix 16.

3. The underlined figures are correlations ≠0.30 of attitude variables with parental variables.

From the correlation Tables 50-51, it can be seen that 'father concerned', 'mother concerned', 'father democratic', 'mother democratic', 'father rational', and 'mother rational' have reasonable correlations with 'attitude to home' as a whole or with the factors 'affiliation' and 'frustration'. This indicates that the favourable parental factors (i.e., 'concerned', 'democratic', and 'rational') play a more important part in influencing children's attitude towards home than the unfavourable ones. It is noted that the cognitive group of variables is highly intercorrelated. Also there appears to be a decline of intellectual abilities as age increases (from 14 yr. 3 mon. to 21 yr. 6 mon. in this sample), and this can be explained that older children are generally repeaters and hence duller than the younger ones.

The correlation tables also show that --

(1) there are significant relationships between 'father concerned' and all cognitive and affective attributes (all significant at the 1°/o level) except the 'social interest' factors 'affiliation' and 'individuality', and also 'unpopularity';

(2) there are significant relationships between 'father restricted' and all cognitive and affective attributes except 'social interest' and its factors 'affiliation' and 'individuality', 'academic motivation' and its factors 'school work' and 'intrinsic motives', and also 'unpopularity';

(3) there are significant relationships between 'mother concerned' and all affective attributes except the 'social interest' factor 'individuality', and 'unpopularity', but only the verbal ability of the cognitive attributes;

(4) there are significant relationships between 'mother restricted' and all cognitive and affective attributes (all significant at the 1°/o level), except 'social interest' and its factors

'affiliation' and 'individuality', 'academic motivation' and its factor 'school work', as well as 'attitude to home' (as measured by the Composition Test) and 'unpopularity';

(5) there are significant relationships between 'father democratic' and all affective attributes, except 'individuality', 'intrinsic motives', 'popularity' and 'unpopularity'; there are also significant negative relationships between 'father democratic' and numerical and verbal+numerical abilities;

(6) there are significant relationships between 'father demanding' and 'attitude to home' and its two factors 'affiliation' and 'frustration';

(7) there are significant relationships between 'mother democratic' and 'attitude to home' and its two factors 'affiliation' and 'frustration', 'social interest' and its factor 'affiliation', 'academic motivation' and its factor 'incentive', and also 'attitude to home' (as measured by the Composition Test); there is also a significant negative relationship between 'mother democratic' and verbal+numerical ability;

(8) there are significant relationships between 'mother demanding' and 'attitude to home' and its factors 'affiliation' and 'frustration'; there are also significant relationships between 'mother demanding' and verbal, verbal+numerical, and general intelligence;

(9) there are significant relationships between 'father autocratic' and 'attitude to home' and its two factors 'affiliation' and 'frustration', 'individuality', 'incentive', 'attitude to home' (as measured by the Composition Test) and also 'popularity';

(10) there are significant relationships between 'father rational' and all affective attributes, except 'individuality', 'popularity' and 'unpopularity';

(11) there are significant relationships between 'mother rational' and all affective attributes except the 'social interest' factors 'affiliation' and 'individuality', 'popularity' and 'unpopularity';

(12) there are significant relationships between 'mother autocratic' and the affective attributes 'attitude to home' and its factors 'affiliation' and 'frustration', 'social interest', and 'academic motivation', and also 'attitude to home' (as measured by the Composition Test); there are also significant relationships between 'mother autocratic' and all cognitive abilities.

It is noteworthy that 'attitude to home' and its factors 'affiliation' and 'frustration' are correlated with all twelve parental variables, while on the other hand, 'individuality' correlates with only one such variable, and 'popularity' with none. This suggests that parental behaviour has an important bearing on students' 'attitude to home', but has little or no effect on their 'individuality' and 'unpopularity'.

To test whether there are significant relationships between types of parental behaviour and achievement in English, science, mathematics, and overall school results, two schools (one boys' and one girls') were selected. The investigator did not attempt to standardise the marks of the fourteen schools in the sample for the following reasons: (1) there are wide variations in the examination systems within schools, and hence no matter how they are standardised, the standard scores obtained might still be questionable, (2) the process of standardisation is a study in itself and could well be left for a future project, (3) the two chosen schools (Nos. 1 and 3 in our sample) are well known to the investigator and their examination systems are more uniform,

and hence in spite of smaller numbers, the results are very likely to be more reliable. School No. 1 is a boys' school where the investigator taught some years ago, and School No. 3 is a girls' school which was visited often by the investigator in his capacity as an inspector of schools. The setting and marking of school examination papers were considered to be consistent and well controlled in these two schools. Also, as an examiner for a number of public examinations, the investigator found that these two schools have maintained a constant academic standard over a considerable period of time. It was therefore believed that these two schools would serve our present purpose quite well. Hence two correlation matrices (one for boys and one for girls) were constructed for all psychological variables and the school achievements.

Table 52: MAXIMUM SCORE, RANGE, MEAN, AND STANDARD DEVIATION OF ALL VARIABLES (INCLUDING ACHIEVEMENTS) (n = 155 boys)

Variable	Max. Score	Range	Mean	S.D.
1 = Age (in months)	222	171-222	196	8.49
2 = Father Concerned	42	6-42	30.74	6.40
3 = Father Restricted	21	3-20	12.95	3.49
4 = Mother Concerned	49	15-48	34.39	6.48
5 = Mother Restricted	21	3-21	14.25	3.33
6 = Father Democratic	56	14-49	33.25	7.46
7 = Father Demanding	28	4-24	15.23	3.85
8 = Mother Democratic	42	9-42	27.61	7.03
9 = Mother Demanding	28	7-27	17.30	3.79
10 = Father Autocratic	35	5-32	19.39	5.65
11 = Father Rational	42	9-41	28.06	5.79
12 = Mother Rational	42	10-41	27.90	5.88
13 = Mother Autocratic	28	4-26	15.66	5.10
14 = Attitude to Home	100	26-83	62.25	11.25
15 = Social Interest	75	31-58	45.94	6.30
16 = Academic Motivation	90	34-75	60.31	8.46
17 = Affiliation Attitude	105	35-99	66.68	11.05
18 = Frustration Attitude	55	21-53	38.39	6.63
19 = Affiliation Interest	95	43-85	65.14	7.46
20 = Individuality Interest	55	15-38	30.16	3.98
21 = School Work	55	23-53	41.75	5.86
22 = Intrinsic Motives	45	23-43	32.17	3.46
23 = Incentive	35	12-35	25.77	4.12
24 = Verbal	32	9-28	18.85	4.14
25 = Numerical	33	5-28	18.11	4.76
26 = Verbal+Numerical	65	15-54	36.96	8.16
27 = Non-Verbal	65	33-87	57.28	6.82
28 = General Intelligence	130	58-116	94.04	11.94
29 = English	100	43-84	61.51	8.74
30 = Science	100	19-77	47.28	12.54
31 = Mathematics	100	11-91	57.30	16.07
32 = Overall Achievement	100	33-76	56.04	8.05
33 = Attitude (Composition)	5	1-5	2.96	1.26
34 = Popularity	42	0-42	13.13	7.75
35 = Unpopularity	68	0-68	11.54	12.28

The above Table 52 shows that most means and standard deviations are reasonable except those for variables 34 (popularity) and 35 (unpopularity) which are rather skewed, as commonly found in sociometric studies.

Table 53: CORRELATION MATRIX OF ALL VARIABLES (INCLUDING ACHIEVEMENTS)

(n = 155 boys)

	1	2	3	4	5	6	7	8	9	10
2	....									
3	....	0.37								
4	....	0.50	....							
5	....	....	....	0.47						
6	....	0.63	....	0.33	....					
7	....	....	0.54	....	....	....				
8	....	0.34	....	0.62	0.34	0.42	....			
9	....	....	....	0.47	0.56	....	....	0.37		
10	....	0.30	0.59	....	....	....	0.50	....	....	
11	....	0.59	0.41	0.31	....	....	0.33	0.31	....	0.39
12	....	....	....	0.62	0.34	0.61	....	0.68	0.38	....
13	....	....	....	0.39	0.44	....	....	0.34	0.60	....
14	....	0.50	....	0.40	....	0.41	....	0.41	....	....
15	....	....	....	....	....	....	....	....	....	....
16	....	....	....	....	....	....	....	....	....	....
17	....	0.42	....	0.39	....	0.44	....	0.45	....	....
18	....	0.44	....	0.35	....	0.42	....	0.34	....	....
19	....	....	....	....	....	....	....	....	....	....
20	....	....	....	....	....	....	....	....	....	....
21	....	....	....	....	....	....	....	....	....	....
22	....	....	....	....	....	....	....	....	....	....
23	....	0.36	....	....	....	....	....	....	....	....
24	....	....	....	....	....	....	....	....	....	....
25	....	....	....	....	....	....	....	....	....	....
26	....	....	....	.....	....	....	....	....	....	....
27	....	....	....	....	....	....	....	....	....	....
28	....	....	....	....	....	....	....	....	....	....
29	....	*	....	....	0.30	....	....	....	*	....
30	....	*	....	....	**	....	....	....	....	....
31	....	....	....	....	....	....	....	....	....	....
32	....	*	....	....	**	....	....	....	....	....
33	....	0.39	....	0.30	....	0.36	....	0.36	....	....
34	....	....	....	....	....	....	....	....	....	....
35	....	....	....	....	....	....	....	....	....	....

Note:
1. Coefficients ≐0.30 are specified.
2. For variables 29-32, coefficients sig. at 5°/o are indicated by *, at 1°/o by **.
3. A fuller table is given in Appendix 17.
4. The underlined figures are correlations ≐0.30 of attitude variables with parental variables.

Table 54: CORRELATION MATRIX OF ALL VARIABLES (INCLUDING ACHIEVEMENTS) (CONT'D)

(n = 155 boys)

	11	12	13	14	15	16	17	18	19	20
12	.....									
13	....	0.41								
14	0.44	0.38	....							
15	....	....	....	0.46						
16	....	....	....	0.63	0.48					
17	0.44	0.37	....	0.70	....	0.43				
18	0.47	0.34	....	0.66	....	0.35	0.72			
19	....	....	....	....	0.48	....	....	....		
20	....	....	....	....	....	....	....	....	....	
21	....	....	....	0.40	....	0.62	0.32	0.34	....	....
22	....	....	....	....	....	0.38	....	....	....	....
23	....	....	....	0.43	....	0.56	0.34	0.39	....	....
24	....	....	....	....	....	....	....	....	....	....
25	....	....	....	....	....	....	....	....	....	....
26	....	....	....	....	....	....	....	....	....	....
27	....	....	....	....	....	....	....	....	....	....
28	....	....	....	....	.....	....	....	....	....	....
29	....	....	....	....	....	**	....	....	....	....
30	....	....	....	....	....	**	....	....	....	....
31	....	....	....	....	....	....	....	....	....	....
32	....	....	....	....	....	**	....	....	....	....
33	0.44	0.30	....	0.60	....	0.34	0.60	0.49	....	....
34	....	....	....	....	....	....	....	....	....	....
35	....	....	....	....	....	....	....	....	....	....

	21	22	23	24	25	26	27	28	29	30
22	0.52									
23	0.70	0.48								
24	....	....	....							
25	....	....	....	0.68						
26	....	....	0.30	0.90	0.93					
27	....	....	....	....	....	0.30				
28	....	....	....	0.77	0.81	0.86	0.68			
29	**	....	**	0.45	0.39	0.46	....	0.36		
30	**	*	**	0.55	0.47	0.55	*	0.49	0.45	
31	**	....	**	0.44	0.48	0.50	....	0.42	0.40	0.64
32	**	....	0.36	0.59	0.54	0.61	*	0.51	0.65	0.89
33	....	....	....	....	....	....	....	....	....	....
34	....	....	0.36	....	....	....	....	....	0.31	....
35	....	....	....	....	....	....	....	....	....	....

	31	32	33	34
32	0.78			
33	....	....		
34	....	*	....	
35	....	....	....	....

Note: 1. Coefficients ≥0.30 are specified.
2. For variables 29-32, coefficients sig. at 5°/o are indicated by *, at 1°/o by **.
3. A fuller table is given in Appendix 17.
4. The underlined figures are correlations ≥0.30 of attitude variables with parental variables.

From the correlation Tables 53-54, it can be seen that for boys --

(1) there are significant relationships between 'father concerned' and English, science, and overall achievement, but not mathematics;

(2) there are significant relationships (all significant at the 1°/o level) between 'mother restricted' and English, science, and overall achievement, but not mathematics;

(3) there is a significant relationship between 'mother demanding' and English.

The tables also show that --

(1) there are significant relationships (all significant at the 1°/o level) between 'academic motivation' and its factors 'school work' and 'incentive' and English, science, and overall achievement, but not mathematics;

(2) there is a significant relationship between 'intrinsic motives' and science;

(3) there are reasonable correlations (all significant at the 1°/o level) between verbal, numerical, verbal+numerical, and general intelligence, and English, science, mathematics, and overall achievement.

(4) there is a significant relationship between non-verbal, and science and overall achievement;

(5) there is a significant relationship between 'popularity' and overall achievement.

Table 55: MAXIMUM SCORE, RANGE, MEAN, AND STANDARD DEVIATION OF ALL VARIABLES

(Including Achievements)
(n = 133 girls)

Variable	Max. Score	Range	Mean	S.D.
1 = Age (in months)	232	173-232	199	10.81
2 = Father Concerned	42	14-42	32.31	6.16
3 = Father Restricted	21	5-21	14.80	3.38
4 = Mother Concerned	49	15-49	35.80	7.54
5 = Mother Restricted	21	4-21	15.39	3.65
6 = Father Democratic	56	11-53	33.71	8.01
7 = Father Demanding	28	4-27	17.09	4.60
8 = Mother Democratic	42	7-41	28.32	7.40
9 = Mother Demanding	28	6-27	16.64	4.75
10 = Father Autocratic	35	6-35	22.41	6.66
11 = Father Rational	42	7-41	28.83	5.73
12 = Mother Rational	42	11-42	28.16	6.24
13 = Mother Autocratic	28	4-27	15.89	5.11
14 = Attitude to Home	100	41-85	69.59	9.50
15 = Social Interest	75	30-60	46.71	6.22
16 = Academic Motivation	90	38-80	61.35	8.16
17 = **Affiliation Attitude**	105	37-95	70.07	11.60
18 = Frustration Attitude	55	22-53	41.53	5.84
19 = **Affiliation Interest**	95	36-81	64.90	6.78
20 = Individuality Interest	55	20-41	31.53	3.79
21 = School Work	55	25-55	43.08	5.35
22 = Intrinsic Motives	45	24-43	32.04	3.26
23 = Incentive	35	13-33	25.53	3.62
24 = Verbal	32	10-28	18.45	3.47
25 = Numerical	33	6-29	18.25	3.80
26 = Verbal+Numerical	65	23-59	36.71	6.93
27 = Non-Verbal	65	26-64	51.78	7.84
28 = General Intelligence	130	53-117	88.49	12.50
29 = English	100	29-88	57.99	8.35
30 = Science	100	41-80	61.50	8.91
31 = Mathematics	100	20-88	57.63	13.04
32 = Overall Achievement	100	41-79	61.56	6.76
33 = Attitude (Composition)	5	1-5	3.32	0.97
34 = Popularity	60	0-60	13.95	10.56
35 = Unpopularity	69	0-69	13.44	14.85

Note: The above Table 55 shows that most means and standard deviations are reasonable except those for variables 34 (popularity) and 35 (unpopularity) which are rather skewed, as commonly found in sociometric studies.

Table 56: CORRELATION MATRIX OF ALL VARIABLES (Including Achievements)
(n = 133 girls)

	1	2	3	4	5	6	7	8	9	10
2	....									
3	....	0.41								
4	....	0.43	....							
5	....	....	....	0.57						
6	....	0.60	0.34	0.31	....					
7	....	....	0.38	....	....	0.34				
8	....	0.30	....	0.56	0.35	0.33	....			
9	....	....	....	0.30	0.53	....	....	....		
10	....	....	0.50	....	....	0.33	0.69	....	....	
11	....	0.61	....	0.34	....	0.66	0.33	0.38	....	0.36
12	....	0.31	....	0.56	0.43	....	....	0.66	....	....
13	....	....	....	0.44	0.60	....	....	0.35	0.58	....
14	....	0.50	....	0.43	0.37	0.47	....	0.40	....	....
15	....	....	....	....	....	....	....	....	....	....
16	....	....	....	....	....	....	....	0.35	....	....
17	....	0.52	....	0.38	....	0.50	....	0.46	....	....
18	....	0.57	....	0.36	....	0.54	....	0.44	....	....
19	....	....	....	....	....	....	....	....	....	....
20	....	....	....	....	....	....	....	....	....	....
21	....	....	....	....	....	....	....	....	....	....
22	....	....	....	....	....	....	....	....	....	....
23	....	0.31	....	....	....	0.30	....	....	....	....
24	....	....	....	....	....	....	....	....	....	....
25	....	....	.....	....	....	....	....	....	....	....
26	....	....	....	....	....	....	....	....	....	....
27	....	....	....	....	....	....	....	....	....	....
28	....	....	....	....	....	....	....	....	....	....
29	-*	....	....	....	....	*	....	....	....	*
30	-0.32	....	....	....	....	....	....	....	....	....
31	-*	....	....	....	....	....	....	....	....	....
32	-0.34	....	....	....	....	....	....	....	....	*
33	....	0.37	....	0.35	....	0.41	....	0.38	....	....
34	....	....	....	....	....	....	....	....	....	....
35	....	....	....	....	....	....	....	....	....	....

Note: 1. Coefficients ≥ 0.30 are specified.
2. For variables 29-32, coefficients sig. at 5°/o are indicated by *, at 1°/o by **.
3. A fuller table is given in Appendix 18.
4. The underlined figures are correlations ≥ 0.30 of attitude variables with parental variables.

Table 57: CORRELATION MATRIX OF ALL VARIABLES (INCLUDING ACHIEVEMENTS)(CONT'D)
(n = 133 girls)

	11	12	13	14	15	16	17	18	19	20
12	0.44									
13	....	0.49								
14	0.55	0.46	....							
15	....	....	....	....						
16	....	0.31	....	0.34	....					
17	0.56	0.45	....	0.66	....	0.34				
18	0.57	0.39	....	0.55	....	0.31	0.70			
19	....	....	....	....	0.30	....	....	....		
20	....	....	....	....	0.31	....	....	....	0.35	
21	....	....	....	....	....	0.44	0.34	0.43	....	....
22	....	....	....	....	....	0.31	0.37	....	....	....
23	0.30	....	....	....	....	0.47	0.32	0.38	0.30	....
24	....	....	....	....	....	....	....	....	....	....
25	....	....	....	....	....	....	....	....	....	....
26	....	....	....	....	....	....	....	....	....	....
27	....	....	....	....	....	....	....	....	....	....
28	....	....	....	....	....	....	....	....	....	....
29	....	....	....	....	....	....	....	....	....	....
30	....	....	....	....	....	*	....	....	....	....
31	....	....	....	....	....	....	....	....	....	....
32	....	.....	....	....	-**	....	....	....	....	....
33	0.45	0.40	....	0.56	....	0.31	0.53	0.50	....	....
34	....	....	....	....	....	....	....	....	....	....
35	....	....	....	....	....	....	....	....	....	....

	21	22	23	24	25	26	27	28	29	30
22	0.39									
23	0.66	0.45								
24	....	....	....							
25	....	....	....	0.68						
26	....	....	....	0.89	0.91					
27	....	....	....	0.38	0.43	0.43				
28	....	....	....	0.73	0.77	0.82	0.87			
29	....	....	....	0.31	**	**	*	**		
30	*	....	*	....	....	....	*	....	0.41	
31	....	....	....	....	....	....	*	*	0.35	0.54
32	*	....	*	*	*	*	*	*	0.55	0.73
33	....	....	....	....	....	....	....	....	....	....
34	....	....	....	....	....	....	....	....	....	....
35	....	....	....	.....	....	....	....	....	....	....

	31	32	33	34
32	0.58			
33	....	....		
34	....	**	....	
35	....	....	....	....

Note:
1. Coefficients ≥ 0.30 are specified.
2. For variables 29-32, coefficients sig. at 5% are indicated by *, at 1% by **.
3. A fuller table is given in Appendix 18.
4. The underlined figures are correlations ≥ 0.30 of attitude with parental variables.

From the correlation Tables 56-57, it can be seen that for girls --

(1) there is a significant relationship between 'father democratic' and English;

(2) there are significant relationships between 'father autocratic' and English and overall achievement.

The tables also show that --

(1) there are significant (negative) relationships between age and English, science, mathematics and overall achievement;

(2) there is a significant (negative) relationship (significant at the 1°/o level) between 'social interest' and overall achievement;

(3) there is a significant relationship between 'academic motivation' and science;

(4) there is a significant relationship between the 'academic motivation' factors 'school work' and 'incentive', and science and overall achievement;

(5) there are significant relationships between verbal, numerical, and verbal+numerical, and English and overall achievement;

(6) there are significant relationships between non-verbal and English, science, mathematics, and overall achievement;

(7) there are significant relationships between general intelligence and English, mathematics and overall achievement;

(8) there is a significant relationship (significant at the 1°/o level) between 'popularity' and overall achievement.

4. Test of Hypothesis II

The correlation matrices in Section 3 were factor analysed to show the patterning of the variables, and thus to help decide what groups of variables should be held constant for analysis of covariance purposes. Analysis of variance techniques were used

to test sex differences in intellectual abilities, affective attributes, and school achievements. In addition, regression models were constructed to give a better understanding of the relation of the above variables to the parental variables of this study.

Table 58: ROTATED FACTOR MATRIX OF ALL VARIABLES (EXCLUDING ACHIEVEMENTS)

(n = 1375)

	I	II	III	IV	V	VI	VII	VIII	h^2
1	....	-0.37	....	....	....	....	....	....	0.23
2	....	....	....	....	....	....	0.70	....	0.60
3	....	....	....	0.75	....	....	....	....	0.63
4	....	....	0.57	....	....	....	0.54	....	0.64
5	....	....	0.62	....	....	....	....	....	0.51
6	....	....	....	....	....	....	0.76	....	0.66
7	....	....	....	0.78	....	....	....	....	0.63
8	....	....	0.42	....	....	....	0.56	....	0.61
9	....	....	0.76	....	....	....	....	....	0.62
10	....	....	....	0.78	....	....	....	....	0.64
11	....	....	....	....	....	....	0.74	....	0.65
12	0.32	....	0.46	....	....	....	0.49	....	0.59
13	....	....	0.73	....	....	....	....	....	0.59
14	0.76	....	....	....	....	....	....	....	0.72
15	....	....	....	....	....	0.69	....	....	0.57
16	0.38	....	....	....	0.59	....	....	....	0.56
17	0.71	....	....	....	....	....	0.41	....	0.71
18	0.64	....	....	....	....	....	....	....	0.62
19	....	....	....	....	....	0.69	....	....	0.62
20	....	....	....	....	....	0.63	....	....	0.50
21	....	....	....	....	0.56	....	....	....	0.36
22	....	.....	....	....	0.75	....	....	....	0.59
23	....	....	....	....	0.77	....	....	....	0.64
24	....	0.87	....	....	....	....	....	....	0.78
25	....	0.90	....	....	....	....	....	....	0.82
26	....	0.95	....	....	....	....	....	....	0.92
27	....	0.80	....	....	....	....	....	....	0.65
28	....	0.97	....	....	....	....	....	....	0.95
29	0.76	....	....	....	....	....	....	....	0.62
30	....	....	....	....	....	....	....	-0.64	0.52
31	....	....	....	....	....	....	....	0.81	0.67
Eigen-value	5.60	4.49	2.11	1.90	1.64	1.33	1.22	1.11	19.40
% of Total Variance	18.1	14.5	6.8	6.1	5.3	4.4	4.0	3.6	62.6

Note: 1. I-VIII are factors; 1-31 are variables.
2. Numbering of variables is the same as in Tables 49-51.
3. Only loadings greater than 0.30 are included.
4. A fuller table is given in Appendix 19.

The factor analysis in Table 58 shows that in the first factor, 'mother rational' is associated with the child~~ren~~'s attitude measurements. The second factor is obviously a cognitive ability factor as all AH4 scores lie closely together as expected. The negative loading of age suggests that in this sample the younger children tend to show higher cognitive abilities. This can again be explained by the fact that the older children in our sample are mostly repeaters. The third and fourth factors show that the mother behaviours hold together in factor three as distinct from father behaviours (i.e., restricted, demanding, and autocratic) which cling together as a very tight group in factor four. Factor five relates together the motivation variables, whereas factor six shows a clear social interest grouping. Factor seven shows that a student's affiliation to his family has much in common with both father and mother concerned, democratic, and rational behaviours. Factor eight is a bipolar factor specific to the ratings of popularity and unpopularity.

Table 59: ROTATED FACTOR MATRIX OF ALL VARIABLES (INCLUDING ACHIEVEMENTS)
(n = 155 boys)

	I	II	III	IV	V	VI	VII	VIII	IX	h^2
1	....	....	....	....	....	....	....	....	0.81	0.70
2	0.68	....	....	....	....	....	....	0.33	....	0.73
3	....	....	....	....	0.83	....	....	....	....	0.76
4	0.46	....	0.64	....	....	....	....	....	....	0.72
5	....	....	0.73	....	....	....	....	....	....	0.68
6	0.74	....	....	....	....	....	....	....	....	0.71
7	....	....	....	....	0.75	....	....	....	....	0.70
8	0.54	....	0.57	....	....	....	....	....	....	0.71
9	....	....	0.82	....	....	....	....	....	....	0.70
10	....	....	....	....	0.80	....	....	....	....	0.70
11	0.70	....	....	....	0.33	....	....	....	....	0.66
12	0.44	....	0.61	....	....	....	....	....	....	0.69
13	....	....	0.79	....	....	....	....	....	....	0.73
14	0.72	....	....	....	....	....	....	....	....	0.81
15	....	....	....	....	....	0.77	....	....	....	0.68
16	....	....	....	0.62	....	0.46	....	....	....	0.77
17	0.79	....	....	....	....	....	....	....	....	0.75
18	0.75	....	....	....	....	....	....	....	....	0.69
19	....	....	....	....	....	0.72	....	0.45	....	0.74
20	....	....	....	....	....	0.64	....	....	....	0.52
21	....	....	....	0.76	....	....	....	....	....	0.72
22	....	....	....	0.71	....	....	....	....	....	0.56
23	....	....	....	0.69	....	....	....	....	....	0.73
24	....	0.75	....	....	....	....	0.40	....	....	0.77
25	....	0.80	....	.....	....	....	0.34	....	....	0.80
26	....	0.85	....	....	....	....	0.40	....	....	0.92
27	....	0.64	....	....	....	....	....	....	0.32	0.59
28	....	0.94	....	....	....	....	....	....	....	0.96
29	....	....	....	....	....	....	0.59	....	....	0.57
30	....	0.31	....	....	....	....	0.81	....	....	0.78
31	....	....	....	....	....	....	0.80	....	....	0.71
32	....	0.32	....	....	....	....	0.89	....	....	0.92
33	0.67	....	....	....	....	....	....	....	....	0.53
34	....	....	....	0.45	....	....	....	0.57	....	0.57
35	....	....	....	-0.49	....	....	....	....	-0.35	0.50
Eigenvalue	7.04	5.34	2.84	2.28	1.95	1.71	1.37	1.20	1.04	24.77
% of Total Variance	20.1	15.2	8.1	6.5	5.6	4.8	3.9	3.4	3.0	70.8

Note: 1. I-IX are factors; 1-35 are variables.
2. Numbering of variables is the same as Tables 52-57.
3. Only loadings greater than 0.30 are included.
4. A fuller table is given in Appendix 20.

This table shows that the cognitive abilities and achievements appear together in factors II and VII with higher loadings for abilities in factor II, and higher loadings for achievements in factor VII. The attribute and parental factors are generally in line with those for the total group (i.e., the previous table).

Table 60: ROTATED FACTOR MATRIX OF ALL VARIABLES (INCLUDING ACHIEVEMENTS)

(n = 133 girls)

	I	II	III	IV	V	VI	VII	VIII	IX	h^2
1	....	....	....	-0.33	....	....	....	....	0.65	0.60
2	0.65	....	....	....	....	....	0.31	....	....	0.60
3	....	....	....	....	....	....	0.63	....	....	0.50
4	0.56	....	0.54	....	....	....	....	....	....	0.67
5	....	....	0.79	....	....	....	....	....	....	0.70
6	0.66	....	....	....	....	....	0.43	....	....	0.72
7	....	.....	....	....	....	....	0.84	....	....	0.73
8	0.57	....	0.38	....	....	....	....	....	....	0.58
9	....	....	0.81	....	....	....	....	....	....	0.70
10	....	....	....	....	....	....	0.86	....	....	0.79
11	0.70	....	....	....	....	....	0.36	....	....	0.70
12	0.57	....	0.46	....	....	....	....	....	....	0.64
13	....	....	0.84	....	....	....	....	....	....	0.76
14	0.76	....	....	....	....	....	....	....	....	0.67
15	....	....	....	....	....	0.61	....	....	....	0.50
16	0.34	....	....	....	0.55	....	....	....	-0.32	0.56
17	0.81	....	....	....	....	....	....	....	....	0.74
18	0.71	....	....	....	....	....	....	....	....	0.66
19	....	....	....	....	0.32	0.67	....	....	0.41	0.76
20	....	....	....	....	....	0.81	....	....	....	0.77
21	....	....	....	....	0.78	....	....	....	....	0.71
22	....	....	....	....	0.67	-0.33	....	....	0.31	0.75
23	....	....	....	....	0.78	....	....	....	....	0.72
24	....	0.86	....	....	....	....	....	....	....	0.79
25	....	0.87	....	....	....	....	....	....	....	0.83
26	....	0.94	....	....	....	....	....	....	....	0.94
27	....	0.66	....	....	....	....	....	....	0.30	0.69
28	....	0.93	....	....	....	....	....	....	....	0.94
29	....	....	....	0.59	....	....	....	....	....	0.52
30	....	....	....	0.84	....	....	....	....	....	0.76
31	....	.....	....	0.76	....	....	....	....	....	0.62
32	....	....	....	0.87	....	....	....	....	....	0.83
33	0.75	....	....	....	....	....	....	....	....	0.59
34	....	.....	....	....	....	....	....	0.63	....	0.58
35	....	....	....	....	....	....	....	-0.82	....	0.71
Eigenvalue	6.87	4.49	2.94	2.36	1.97	1.70	1.51	1.33	1.18	24.35
% of Total Variance	19.6	12.8	8.4	6.7	5.6	4.9	4.4	3.8	3.4	69.5

Note: 1. I-IX are factors; 1-35 are variables.
2. Numbering of variables is the same as Tables 52-57.
3. Only loadings greater than 0.30 are included.
4. A fuller table is given in Appendix 21.

This table shows that the cognitive abilities and achievements appear in factor II and factor IV respectively, showing that they are distinct from other variables and that for girls achievement is less related to intelligence than for boys. Other groups of variables are in general similar to those shown in the previous two factor matrices though the order of the factors is not entirely the same.

A number of analyses of variance are reported below, the purpose being to discover whether there are significant sex differences in cognitive abilities, attitude to home, social interest, academic motivation, and popularity. Based on the results of the factor analysis of all the variables investigated (excluding achievements), it seems reasonable to regard the following variables as constituting different clusters: all maternal behaviour, all paternal unfavourable behaviour, and all parental favourable behaviour. Therefore, scores on these clusters were used as covariates to see whether there are still significant sex differences after their effects have been removed. The factor analysis results of all the variables including achievements also show that the achievement variables appear together in a factor. This suggests that sex differences in this cluster should also be investigated. A mixed school was used for this purpose. Age and intelligence are believed to have importance for achievement (as shown quite clearly in the factor analysis tables), therefore the effects of age and intelligence were partialled out together to see whether there were still sex differences in achievement. It is of interest to see also what the results would be when the twelve parental variables are treated as covariates altogether.

Table 61: ANOVA IN ALL VARIABLES (EXCLUDING ACHIEVEMENTS) (BETWEEN SEXES)

	Dependent Variables	Mean (boy) (n = 912)	S.D.	Mean (girl) (n = 496)	S.D.	F (df = 1, 1406)	Sig.
1	Age	204.18	12.75	203.57	12.81	0.47	No
2	Father Concerned	31.16	5.87	31.22	6.33	0.02	No
3	Father Restricted	12.52	3.30	13.38	3.41	21.43	1%
4	Mother Concerned	34.39	6.43	34.80	7.04	1.23	No
5	Mother Restricted	13.55	3.15	13.63	3.54	0.18	No
6	Father Democratic	35.18	6.98	35.04	7.31	0.13	No
7	Father Demanding	15.29	3.54	16.06	3.94	13.98	1%
8	Mother Democratic	28.47	6.54	28.98	7.24	1.82	No
9	Mother Demanding	16.47	3.90	16.45	4.05	0.01	No
10	Father Autocratic	19.37	4.72	21.35	5.28	51.94	1%
11	Father Rational	28.49	5.45	29.06	5.75	3.39	No
12	Mother Rational	28.05	5.40	28.01	6.29	0.02	No
13	Mother Autocratic	15.78	4.67	16.87	4.64	17.50	1%
14	Attitude to Home	65.15	10.20	66.73	11.50	7.00	1%
15	Social Interest	48.20	6.41	48.64	6.32	1.55	No
16	Academic Motivation	61.07	7.90	62.12	7.49	5.80	5%
17	Affiliation Attitude	68.86	10.48	68.39	12.03	0.58	No
18	Frustration Attitude	38.30	6.03	38.49	6.78	0.28	No
19	Affiliation Interest	66.04	7.03	65.47	6.46	2.24	No
20	Individuality Interest	30.89	4.12	31.21	4.30	1.81	No
21	School Work	39.58	12.20	40.45	5.67	2.23	No
22	Intrinsic Motives	31.61	3.42	31.58	3.38	0.03	No
23	Incentive	25.02	3.68	25.22	3.40	1.00	No
24	Verbal	15.13	4.56	14.65	4.56	3.39*	No
25	Numerical	13.99	5.22	12.96	5.41	11.88*	1%
26	Verbal+Numerical	29.08	9.11	27.56	9.34	8.66*	1%
27	Non-Verbal	50.57	9.87	45.59	10.07	78.71*	1%
28	General Intelligence	79.59	16.79	73.09	17.62	45.51*	1%
29	Attitude (Composition)	3.19	1.19	3.22	1.19	0.27	No
30	Popularity	10.95	7.71	11.83	8.09	4.05	5%
31	Unpopularity	10.04	10.82	9.21	10.57	1.90	No

Note: 1. The favourable poles for variables 2-30 are given higher scores; the reverse is for variable 31.

2. * df = 1,1388; n_1 = 910; n_2 = 480.

From the above Table 61, it can be seen that among the parental behaviour, there are significant sex differences in favour of girls at 1% level in 'father restricted', 'father demanding', 'father autocratic', and 'mother autocratic'. It is also noted that the girls are significantly better than the boys in 'attitude to home', 'academic motivation' and 'popularity'. However, the boys are better than the girls in all intellectual abilities, except that the difference in verbal ability appears not to be significant.

Table 62: ANOVA IN COGNITIVE AND AFFECTIVE ATTRIBUTES (BETWEEN SEXES)

A. Cognitive Abilities	F (df = 1, 1388)	Significance
1. Verbal	3.39	NO
2. Numerical	11.38	1%
3. Verbal+Numerical	8.66	1%
4. Non-Verbal	78.71	1%
5. General Intelligence	45.51	1%
(Multivariate: F=18.67, df = 5, 1384, significant at 1%)		
B. Attitute to Home	**F (df = 1, 1406)**	**Significance**
1. Sentence Completion	7.00	1%
2. Affiliation (Likert)	0.58	NO
3. Frustration (Likert)	0.28	NO
4. Composition	0.27	NO
(Multivariate: F = 4.64, df = 4, 1403, significant at 1%)		
C. Social Interest	**F (df = 1, 1406)**	**Significance**
1. Sentence Completion	1.55	NO
2. Affiliation (Likert)	2.24	NO
3. Individuality (Likert)	1.81	NO
(Multivariate: F = 2.42, df = 3, 1404, not significant)		
D. Academic Motivation	**F (df = 1, 1406)**	**Significance**
1. Sentence Completion	5.80	5%
2. School Work (Likert)	2.23	NO
3. Intrinsic Motives (Likert)	0.03	NO
4. Incentive (Likert)	1.00	NO
(Multivariate: F = 1.96, df = 4, 1403, not significant)		
E. Popularity	**F (df = 1, 1406)**	**Significance**
1. Popularity	4.05	5%
2. Unpopularity	1.90	NO
(Multivariate: F = 2.68, df = 2, 1405, not significant)		

Table 62 shows that there is an overall significant sex difference in intellectual abilities and 'attitude to home' but not in 'social interest', 'academic motivation', and 'popularity'. However, there is a significant sex difference in 'academic motivation' (as measured by the Sentence Completion Test), and also in 'popularity' (as measured by the 'favourable' part of the Popularity Test).

Table 63: ANCOVA IN COGNITIVE AND AFFECTIVE ATTRIBUTES (BETWEEN SEXES)

A. Cognitive Abilities	F (df = 1, 1382)	Significance
1. Verbal	1.63	NO
2. Numerical	8.43	1°/o
3. Verbal+Numerical	5.64	5°/o
4. Non-Verbal	69.79	1°/o
5. General Intelligence	38.64	1°/o
(Multivariate: F = 17.01, df = 5, 1378, significant at 1°/o)		
B. Attitude to Home	**F (df = 1, 1400)**	**Significance**
1. Sentence Completion	6.88	1°/o
2. Affiliation (Likert)	0.86	NO
3. Frustration (Likert)	0.27	NO
4. Composition	0.06	NO
(Multivariate: F = 4.04, df = 4, 1397, significant at 5°/o)		
C. Social Interest	**F (df = 1, 1400)**	**Significance**
1. Sentence Completion	0.87	NO
2. Affiliation (Likert)	1.91	NO
3. Individuality (Likert)	1.24	NO
(Multivariate: F = 1.75, df = 3, 1378, not significant)		
D. Academic Motivation	**F (df = 1, 1400)**	**Significance**
1. Sentence Completion	5.54	5°/o
2. School Work	2.96	NO
3. Intrinsic Motives	0.01	NO
4. Incentive	2.04	NO
(Multivariate: F = 1.95, df = 4, 1397, not significant)		
E. Popularity	**F (df = 1, 1400)**	**Significance**
1. Popularity	3.96	5°/o
2. Unpopularity	2.12	NO
(Multivariate: F = 2.71, df = 2, 1399, not significant)		

Note: Covariates are all maternal variables --- mother concerned, mother restricted, mother democratic, mother demanding, mother rational, mother autocratic.

Table 63 shows that when the effect of all maternal factors is removed, the sex differences in overall cognitive abilities and 'attitude to home' remain significant, though the corresponding probabilities are generally lowered. The F ratios for all cognitive abilities are the most affected. This suggests that maternal behaviour contributes more to the sex differences in intellectual aspects than to other attributes.

Table 64: ANCOVA IN COGNITIVE AND AFFECTIVE ATTRIBUTES (BETWEEN SEXES) (CONT'D)

A. Cognitive Abilities	F (df = 1, 1385)	Significance
1. Verbal	4.86	5%
2. Numerical	13.98	1%
3. Verbal+Numerical	10.96	1%
4. Non-Verbal	84.07	1%
5. General Intelligence	51.13	1%
(Multivariate: F = 19.37, df = 5, 1381, significant at 1%)		
B. Attitude to Home	**F (df = 1, 1403)**	**Significance**
1. Sentence Completion	2.37	NO
2. Affiliation (Likert)	2.71	NO
3. Frustration (Likert)	0.95	NO
4. Composition	0.06	NO
(Multivariate: F = 3.84, df = 4, 1400, significant at 5%)		
C. Social Interest	**F (df = 1, 1403)**	**Significance**
1. Sentence Completion	1.09	NO
2. Affiliation (Likert)	2.35	NO
3. Individuality (Likert)	0.77	NO
(Multivariate: F = 1.91, df = 3, 1401, not significant)		
D. Academic Motivation	**F (df = 1, 1403)**	**Significance**
1. Sentence Completion	3.98	5%
2. School Work	1.25	NO
3. Intrinsic Motives	0.07	NO
4. Incentive	0.14	NO
(Multivariate: F = 1.40, df = 4, 1400, not significant)		
E. Popularity	**F (df = 1, 1403)**	**Significance**
1. Popularity	1.68	NO
2. Unpopularity	1.46	NO
(Multivariate: F = 1.40, df = 2, 1402, not significant)		

Note: Covariates are all paternal unfavourable variables --- father restricted, father demanding, father autocratic.

Table 64 shows that when the effect of all paternal unfavourable behaviour,i.e., restricted, demanding, and autocratic, is removed, the sex differences in overall 'attitude to home', 'social interest', 'academic motivation', 'popularity' remain the same, though the corresponding probabilities are lowered. However, the F ratios for intellectual abilities become higher. The sex difference in verbal ability becomes significant after the effect of the paternal unfavourable behaviour is removed. This suggests that the paternal unfavourable behaviour tends to reduce sex differences in intellectual and particularly verbal abilities.

Table 65: ANCOVA IN COGNITIVE AND AFFECTIVE ATTRIBUTES (BETWEEN SEXES) (CONT'D)

A. Cognitive Abilities	F (df = 1, 1382)	Significance
1. Verbal	3.67	NO
2. Numerical	12.77	1°/o
3. Verbal+Numerical	9.49	1°/o
4. Non-Verbal	83.10	1°/o
5. General Intelligence	49.13	1°/o
(Multivariate: F = 19.42, df = 5, 1378, significant at 1°/o)		
B. Attitude to Home	**F (df = 1, 1400)**	**Significance**
1. Sentence Completion	6.97	1°/o
2. Affiliation (Likert)	2.48	NO
3. Frustration (Likert)	0.00	NO
4. Composition	0.09	NO
(Multivariate: F = 4.76, df = 4, 1397, significant at 5°/o)		
C. Social Interest	**F (df = 1, 1400)**	**Significance**
1. Sentence Completion	1.25	NO
2. Affiliation (Likert)	3.09	NO
3. Individuality (Likert)	1.73	NO
(Multivariate: F = 2.62, df = 3, 1398, not significant)		
D. Academic Motivation	**F (df = 1, 1400)**	**Significance**
1. Sentence Completion	5.25	5°/o
2. School Work	2.03	NO
3. Intrinsic Motives	0.07	NO
4. Incentive	0.67	NO
(Multivariate: F = 1.82, df = 4, 1397, not significant)		
E. Popularity	**F (df = 1, 1400)**	**Significance**
1. Popularity	3.55	NO
2. Unpopularity	1.96	NO
(Multivariate: F = 2.47, df = 2, 1399, not significant)		

Note: Covariates are all parental favourable variables --- father and mother concerned, father and mother democratic, father and mother rational.

Table 65 shows that when the effect of all parental favourable behaviour, i.e., concerned, democratic, and rational, is removed, the sex differences in overall cognitive abilities, 'attitude to home', and 'social interest' become more significant than previously, showing that parental favourable behaviour tends to reduce sex differences in the above aspects. On the other hand, the sex differences in overall 'academic motivation' and 'popularity' become less significant than before, showing that parental favourable behaviour contributes to these differences.

Table 66: ANCOVA IN COGNITIVE AND AFFECTIVE ATTRIBUTES (BETWEEN SEXES) (CONT'D)

Dependent Variables	F (df = 1, 1394)	Significance
14. Attitude to Home	4.12	5%
15. Social Interest	0.92	NO
16. Academic Motivation	4.91	5%
17. Affiliation Attitude	2.39	NO
18. Frustration Attitude	0.52	NO
19. Affiliation Interest	1.46	NO
20. Individuality Interest	0.46	NO
21. School Work	2.26	NO
22. Intrinsic Motives	0.03	NO
23. Incentive	1.21	NO
24. Verbal	2.16*	NO
25. Numerical	9.85*	1%
26. Verbal+Numerical	6.90*	1%
27. Non-Verbal	75.81*	1%
28. General Intelligence	43.45*	1%
29. Attitude (Composition)	0.03	NO
30. Popularity	2.07	NO
31. Unpopularity	1.41	NO

Note: 1. Covariates are all twelve parental variables.
2. Numbering of dependent variables is the same as Table 61.
3. * df = 1, 1376.

From the above Table 66, it can be seen that when the effect of all parental behaviour is removed, the F ratios become smaller (to various degrees) for 'attitude to home', 'social interest' and its two factors 'affiliation' and 'individuality', 'academic motivation', intellectual abilities, 'popularity' and 'unpopularity'. This finding suggests that general parental behaviour appears to contribute to the sex differences in the above attributes. On the other hand, the sex differences in the attitude factors 'affiliation' and 'frustration' and in the motivation factors 'school work' and 'incentive' become more significant, showing that the parental behaviour on the whole tends to reduce sex differences in these aspects.

To test sex differences in achievement, a mixed school (School No. 12) consisting of 82 boys and 65 girls was used. While the numbers are smaller, it was necessary to ensure that boys and girls had been marked on the same standard. The investigator was familiar with this school and its examination system, and it was considered appropriate for the present purposes, having an average academic standard.

Table 67: ANOVA IN ACHIEVEMENTS (BETWEEN SEXES)

Achievement	Mean (Boy)	S.D.	Mean (Girl)	S.D.	F (df = 1, 133)	Significance
1. English	64.55	5.10	64.67	10.37	0.01	NO
2. Science	60.18	12.09	57.88	10.45	1.33	NO
3. Mathematics	60.18	13.66	52.22	13.95	10.87	1°/o
4. Overall Achi.	66.08	7.06	65.26	7.11	0.44	NO
(Multivariate: F = 4.93, df = 4, 130, significant at 1°/o)						

Table 68: ANCOVA IN ACHIEVEMENTS (BETWEEN SEXES)

Achievement	F (df = 1, 127)	Significance
1. English	0.01	NO
2. Science	1.72	NO
3. Mathematics	10.81	1°/o
4. Overall Achi.	0.52	NO
(Multivariate: F = 5.21, df = 4, 124, significant at 1°/o)		

Note: Covariates are all maternal variables --- mother concerned, mother restricted, mother democratic, mother demanding, mother rational, mother autocratic.

Table 69: ANCOVA IN ACHIEVEMENTS (BETWEEN SEXES) (CONT'D)

Achievement	F (df = 1, 130)	Significance
1. English	0.00	NO
2. Science	1.52	NO
3. Mathematics	11.14	1°/o
4. Overall Achi.	0.56	NO
(Multivariate: F = 4.78, df = 4, 127, significant at 1°/o)		

Note: Covariates are all paternal unfavourable variables --- father restricted, father demanding, father autocratic.

Table 70: ANCOVA IN ACHIEVEMENTS (BETWEEN SEXES) (CONT'D)

Achievement	F (df = 1, 127)	Significance
1. English	0.27	NO
2. Science	1.18	NO
3. Mathematics	9.57	1°/o
4. Overall Achi.	0.26	NO
(Multivariate: F = 4.54, df = 4, 124, significant at 1°/o)		

Note: Covariates are all parental favourable variables --- father and mother concerned, father and mother democratic, father and mother rational.

Table 71: ANCOVA IN ACHIEVEMENTS (BETWEEN SEXES) (CONT'D)

Achievement	F (df = 1, 121)	Significance
1. English	0.06	NO
2. Science	1.31	NO
3. Mathematics	9.99	1°/o
4. Overall Achi.	0.34	NO
(Multivariate: F = 4.76, df = 4, 118, significant at 1°/o)		

Note: Covariates are all 12 parental variables.

Tables 67-71 show that boys are significantly better than girls in mathematics and also better (though not significantly) in science and overall achievements. This is in accordance with previous findings of this investigation regarding sex differences in intellectual abilities. When the effect of all maternal behaviour is removed, the F ratios are raised for science and overall achievements, showing that maternal behaviour tends to reduce sex difference in these areas. On the other hand, when the effects of all parental favourable behaviour, and all parental behaviour (favourable and unfavourable) are removed in turn, the corresponding probabilities for science, mathematics and overall achievements are lowered. This suggests that these two groups of parental behaviour tend to contribute to sex differences in these achievements. However, when the effect of all paternal unfavourable behaviour is removed, the corresponding F ratios for science, mathematics and overall achievements are raised, suggesting that unfavourable father behaviour tends to reduce sex differences in these three areas. Also, it is important

to note that when the effect of all parental favourable behaviour is removed, the F ratio for English is more markedly raised. This appears to show that parental favourable behaviour helps to reduce sex difference in the verbal subject of English.

Table 72: ANCOVA IN ACHIEVEMENTS (BETWEEN SEXES) (CONT'D)

Achievement	F (1, 127)	Significance
1. English	0.02	NO
2. Science	0.15	NO
3. Mathematics	5.92	5%
4. Overall Achi.	0.03	NO
(Multivariate: F = 3.81, df = 4, 124, not significant)		

Note: Covariates are age and intellectual abilities.

The above Table 72 shows that when the effects of both age and intellectual abilities are removed, there is a marked tendency for all F ratios except that for English to decrease. This shows clearly that age and intellectual abilities are largely responsible for the sex differences in achievements.

STEPWISE MULTIPLE REGRESSION

All the twelve PID variables namely ---

X_1 = Father Treatment 1 (Concerned)
X_2 = Father Treatment 2 (Restricted)
X_3 = Mother Treatment 1 (Concerned)
X_4 = Mother Treatment 2 (Restricted)
X_5 = Father Taught 1 (Democratic)
X_6 = Father Taught 2 (Demanding)
X_7 = Mother Taught 1 (Democratic)
X_8 = Mother Taught 2 (Demanding)
X_9 = Father Disciplined 1 (Autocratic)
X_{10} = Father Disciplined 2 (Rational)
X_{11} = Mother Disciplined 1 (Rational)
X_{12} = Mother Disciplined 2 (Autocratic)

were entered into a stepwise multiple regression analysis; by minimising the number of independent variables and by maximising the level of explanation, it was hoped to identify the most significant variables for prediction. The scores of the cognitive, affective attributes and achievement were treated as dependent variables.

M. 2: REGRESSION MODELS FOR COGNITIVE ABILITIES
(n = 1393)

1. Verbal (R = 0.30) (F = 27.33, df1 = 5, df2 = 1387, sig. at 1°/o)
$Y_1 = 11.83 + 0.31X_4 - 0.12X_{12} + 0.13X_1 - 0.06X_5 - 0.04X_7$

2. Numerical (R = 0.32) (F = 31.83, df1 = 5, df2 = 1387, sig. at 1°/o)
$Y_2 = 10.33 + 0.34X_4 - 0.18X_{12} + 0.17X_1 - 0.14X_5 + 0.05X_{11}$

3. Verbal+Numerical (R = 0.34) (F = 35.55, df1 = 5, df2 = 1387, sig. at 1°/o)
$Y_3 = 21.57 + 0.63X_4 - 0.30X_{12} + 0.30X_1 - 0.22X_5 + 0.15X_2$

4. Non-Verbal (R = 0.21) (F = 13.25, df1 = 5, df2 = 1387, sig. at 1°/o)
$Y_4 = 45.79 - 0.35X_{12} + 0.26X_4 + 0.23X_1 - 0.15X_5 + 0.19X_8$

5. General Intelligence (R = 0.30) (F = 27.18, df1 = 5, df2 = 1387, sig. at 1°/o)
$Y_5 = 67.36 + 0.89X_4 - 0.68X_{12} + 0.55X_1 - 0.37X_5 + 0.29X_8$

The models show that X_4 (maternal restricted treatment) figures significantly. In four of the five models it is the first variable that was entered by the analysis, and it accounts for the bulk of the variations. It can also be seen that the really significant variables in the models number no more than four, two of them being maternal factors and the other two paternal factors. However, the maternal factors were entered first into the regression equations in all cases. This indicates that the models are much more strongly influenced by maternal factors. With the exception of Y_4, all the models have the same first four independent variables which are in the same order of importance. It is of interest to note that the maternal factors are X_4 ('restricted') and X_{12} ('autocratic') while the paternal factors are X_1 ('concerned') and X_5 ('democratic') in all the models. It can therefore be said that X_4 (maternal restricted treatment) is adverse to, and X_{12} (maternal autocratic discipline) is conducive to, intellectual development. On the other hand, presence of X_1 (paternal concerned treatment) and lack of X_5 (paternal democratic teaching) seem also to have important favourable influences on the child's intelligence, though to a smaller extent than the maternal factors. It should also be noted that the non-verbal ability appears different from the rest in the sense that X_4 (maternal restricted treatment) is only second in position

in the regression equation. This confirms what we found in Chapter Seven (p.152).

M. 3: REGRESSION MODELS FOR COGNITIVE ABILITIES (n = 910 boys)

1. Verbal (R = 0.26) (F = 13.38, df1 = 5, df2 = 904, sig. at 1°/o)
$Y_1 = 10.87 + 0.29X_4 + 0.14X_1 - 0.10X_5 - 0.11X_{12} + 0.07X_{11}$

2. Numerical (R = 0.27) (F = 14.47, df1 = 5, df2 = 904, sig. at 1°/o)
$Y_2 = 12.37 + 0.25X_4 - 0.12X_{12} + 0.19X_1 - 0.13X_5 - 0.07X_9$

3. Verbal+Numerical (R = 0.29) (F = 16.77, df1 = 5, df2 = 904, sig. at 1°/o)
$Y_3 = 24.99 + 0.50X_4 + 0.35X_1 - 0.22X_5 - 0.22X_{12} - 0.14X_9$

4. Non-Verbal (R = 0.19) (F = 6.50, df1 = 5, df2 = 904, sig. at 1°/o)
$Y_4 = 46.89 + 0.21X_1 - 0.24X_5 + 0.18X_{10} - 0.21X_{12} + 0.21X_8$

5. General Intelligence (R = 0.26) (F = 12.68, df1 = 5, df2 = 904, sig. at 1°/o)
$Y_5 = 68.66 + 0.57X_1 - 0.43X_5 + 0.64X_4 - 0.46X_{12} + 0.25X_{11}$

M. 4: REGRESSION MODELS FOR COGNITIVE ABILITIES (n = 483 girls)

1. Verbal (R = 0.40) (F = 17.67, df1 = 5, df2 = 477, sig. at 1°/o)
$Y_1 = 10.18 + 0.41X_4 - 0.19X_{12} + 0.13X_6 + 0.12X_2 - 0.04X_5$

2. Numerical (R = 0.43) (F = 21.87, df1 = 5, df2 = 477, sig. at 1°/o)
$Y_2 = 8.31 + 0.44X_4 - 0.17X_{12} + 0.25X_2 - 0.16X_5 + 0.12X_1$

3. Verbal+Numerical (R = 0.45) (F = 24.10, df1 = 5, df2 = 477, sig. at 1°/o)
$Y_3 = 18.53 + 0.83X_4 - 0.36X_{12} + 0.44X_2 - 0.23X_5 + 0.19X_1$

4. Non-Verbal (R = 0.28) (F = 8.41, df1 = 5, df2 = 477, sig. at 1°/o)
$Y_4 = 39.66 + 0.54X_4 - 0.36X_{12} + 0.21X_1 - 0.15X_5 + 0.16X_9$

5. General Intelligence (R = 0.39) (F = 17.56, df1 = 5, df2 = 477, sig. at 1°/o)
$Y_5 = 58.31 + 1.29X_4 - 0.68X_{12} + 0.68X_2 - 0.39X_5 + 0.41X_1$

From the above two tables, it can be seen that X_4 and X_{12} again generally stand out as important variables in the predictions of cognitive abilities for boys and girls. The non-verbal regression equation for boys differs considerably from the equations for other cognitive abilities. On the whole, the girls' cognitive abilities fall more in line with the general pattern of the whole sample than the boys. Furthermore, the corresponding multiple correlations for girls are higher than for boys. This evidence seems to suggest that parents tend to have greater influence on girls' cognitive

abilities than on boys'. It is also noted that the multiple correlation is lowest for non-verbal ability in both boy and girl groups, which may mean that exercises and practices bearing on this ability are not much emphasized by Chinese parents. This confirms the point already made regarding the emphasis on verbal materials and rote learning for examination purposes by Hong Kong parents and teachers.

M. 5: REGRESSION MODELS FOR AFFECTIVE ASPECTS
(n = 1408)

1. Attitude (R = 0.52) (F = 103.46, df1 = 5, df2 = 1402, sig. at 1°/o)

$$Y_1 = 28.72 + 0.23X_{10} + 0.35X_{11} + 0.28X_1 + 0.21X_7 + 0.16X_5$$

2. Interest (R = 0.22) (F = 14.63, df1 = 5, df2 = 1402, sig. at 1°/o)

$$Y_2 = 40.37 + 0.09X_5 + 0.08X_7 + 0.09X_{10} - 0.09X_2 + 0.06X_{12}$$

3. Motivation (R = 0.27) (F = 21.91, df1 = 5, df2 = 1402, sig. at 1°/o)

$$Y_3 = 49.23 + 0.10X_7 + 0.13X_1 + 0.14X_{11} + 0.07X_5 - 0.09X_6$$

4. Affiliation Attitude (R = 0.58) (F = 145.62, df1 = 5, df2 = 1402, sig.at 1°/o)

$$Y_4 = 26.03 + 0.33X_{10} + 0.27X_7 + 0.23X_1 + 0.37X_{11} + 0.23X_5$$

5. Frustration (R = 0.50) (F = 95.90, df1 = 5, df2 = 1402, sig. at 1°/o)

$$Y_5 = 15.70 + 0.18X_1 + 0.18X_{11} + 0.20X_{10} + 0.22X_2 + 0.11X_3$$

6. Affiliation Interest (R = 0.18) (F = 9.86, df1 = 5, df2 = 1402, sig. at 1°/o)

$$Y_6 = 62.47 + 0.09X_5 - 0.14X_6 - 0.13X_{12} + 0.07X_3 + 0.06X_{10}$$

7. Individuality (R = 0.11) (F = 3.30, df1 = 5, df2 = 1402, sig. at 1°/o)

$$Y_7 = 29.28 + 0.04X_9 - 0.08X_8 + 0.05X_{12} + 0.04X_6 + 0.02X_5$$

8. School Work (R = 0.15) (F = 6.39, df1 = 5, df2 = 1402, sig. at 1°/o)

$$Y_8 = 30.84 + 0.19X_1 + 0.10X_{11} - 0.12X_{12} + 0.07X_9 + 0.07X_4$$

9. Intrinsic Motives (R = 0.20) (F = 12.09, df1 = 5, df2 = 1402, sig. at 1°/o)

$$Y_9 = 28.91 + 0.06X_1 + 0.05X_3 - 0.06X_6 - 0.06X_{12} + 0.06X_4$$

10. Incentive (R = 0.29) (F = 25.53, df1 = 5, df2 = 1402, sig. at 1°/o)

$$Y_{10} = 18.78 + 0.09X_1 + 0.07X_{11} + 0.12X_4 - 0.07X_{12} + 0.04X_{10}$$

M. 6: REGRESSION MODELS FOR AFFECTIVE ASPECTS
(n = 912 boys)

1. Attitude (R = 0.51) (F = 62.42, df1 = 5, df2 = 906, sig. at 1°/o)

$Y_1 = 29.68 + 0.21X_5 + 0.28X_{11} + 0.21X_1 + 0.24X_7 + 0.24X_{10}$

2. Interest (R = 0.24) (F = 10.80, df1 = 5, df2 = 906, sig. at 1°/o)

$Y_2 = 39.27 + 0.12X_5 + 0.12X_7 + 0.09X_9 + 0.11X_{12} - 0.12X_8$

3. Motivation (R = 0.27) (F = 14.65, df1 = 5, df2 = 906, sig. at 1°/o)

$Y_3 = 49.22 + 0.16X_5 + 0.15X_{11} + 0.20X_9 - 0.22X_6 + 0.11X_3$

4. Affiliation Attitude (R = 0.56) (F = 80.71, df1 = 5, df2 = 906, sig.at1°/o)

$Y_4 = 29.11 + 0.42X_{10} + 0.23X_7 + 0.27X_{11} + 0.25X_5 + 0.14X_3$

5. Frustration (R = 0.49) (F = 56.22, df1 = 5, df2 = 906, sig. at 1°/o)

$Y_5 = 15.76 + 0.22X_{10} + 0.12X_3 + 0.17X_1 + 0.16X_{11} + 0.16X_6$

6. Affiliation Interest (R = 0.22) (F = 9.27, df1 = 5, df2 = 906, sig. at 1°/o)

$Y_6 = 62.03 + 0.12X_5 - 0.17X_6 - 0.17X_{12} + 0.11X_7 + 0.15X_4$

7. Individuality (R = 0.11) (F = 2.19, df1 = 5, df2 = 906, not sig.)

$Y_7 = 28.46 + 0.06X_9 + 0.03X_7 + 0.02X_5 - 0.05X_8 + 0.02X_{12}$

8. School Work (R = 0.12) (F = 2.70, df1 = 5, df2 = 906, sig. at 5°/o)

$Y_8 = 33.75 + 0.19X_1 - 0.14X_{12} + 0.09X_{11} - 0.13X_6 + 0.09X_9$

9. Intrinsic Motives (R = 0.21) (F = 8.12, df1 = 5, df2 = 906, sig. at 1°/o)

$Y_9 = 29.40 + 0.05X_3 - 0.08X_{12} + 0.05X_1 - 0.06X_6 + 0.04X_{11}$

10. Incentive (R = 0.29) (F = 16.72, df1 = 5, df2 = 906, sig.at 1°/o)

$Y_{10} = 19.83 + 0.11X_1 + 0.09X_{11} + 0.14X_4 - 0.09X_{12} - 0.07X_6$

N. 7: REGRESSION MODELS FOR AFFECTIVE ASPECTS
(n = 496 girls)

1. Attitude (R = 0.55) (F = 42.23, df1 = 5, df2 = 490, sig. at 1°/o)

$$Y_1 = 26.33 + 0.46X_{11} + 0.38X_1 + 0.21X_{10} + 0.19X_7 + 0.19X_9$$

2. Interest (R = 0.27) (F = 7.73, df1 = 5, df2 = 490, sig. at 1°/o)

$$Y_2 = 44.30 + 0.09X_5 - 0.25X_2 + 0.13X_{11} - 0.14X_4 + 0.09X_{10}$$

3. Motivation (R = 0.32) (F = 11.53, df1 = 5, df2 = 490, sig. at 1°/o)

$$Y_3 = 50.66 + 0.19X_7 + 0.17X_1 - 0.14X_9 + 0.09X_{11} + 0.06X_8$$

4. Affiliation Attitude (R = 0.64) (F = 66.48, df1 = 5, df2 = 490, sig. at 1°/o)

$$Y_4 = 20.65 + 0.25X_{10} + 0.40X_{11} + 0.38X_1 + 0.27X_5 + 0.27X_7$$

5. Frustration (R = 0.54) (F = 41.38, df1 = 5, df2 = 490, sig. at 1°/o)

$$Y_5 = 13.40 + 0.22X_1 + 0.22X_{11} + 0.28X_2 + 0.18X_{10} + 0.24X_4$$

6. Affiliation Interest (R = 0.17) (F = 3.00, df1 = 5, df2 = 490, sig. at 5°/o)

$$Y_6 = 62.70 + 0.10X_{10} - 0.14X_{11} + 0.10X_3 - 0.08X_8 + 0.05X_5$$

7. Individuality (R = 0.17) (F = 3.92, df1 = 5, df2 = 490, sig. at 1°/o)

$$Y_7 = 29.76 + 0.13X_6 - 0.13X_8 + 0.11X_{12} - 0.05X_7 + 0.04X_{10}$$

8. School Work (R = 0.35) (F = 13.43, df1 = 5, df2 = 490, sig. at 1°/o)

$$X_8 = 28.77 + 0.19X_1 + 0.21X_4 + 0.10X_{11} + 0.12X_2 - 0.08X_{12}$$

9. Intrinsic Motives (R = 0.23) (F = 5.56, df1 = 5, df2 = 490, sig. at 1°/o)

$$Y_9 = 27.94 + 0.09X_1 + 0.04X_7 + 0.07X_4 - 0.06X_6 - 0.02X_5$$

10. Incentive (R = 0.31) (F = 10.10, df1 = 5, df2 = 490, sig. at 1°/o)

$$Y_{10} = 19.02 + 0.07X_1 + 0.06X_{11} + 0.10X_4 + 0.06X_{10} - 0.05X_{12}$$

M. 8: REGRESSION MODELS FOR AFFECTIVE ASPECTS
(n = 1385)

11. Attitude (Comp.) (R = 0.42) (F = 58.03, df1 = 5, df2 = 1379, sig. at 1°/o)
$Y_{11} = -0.11 + 0.03X_5 + 0.03X_{11} + 0.02X_7 + 0.02X_{10} + 0.01X_9$

12. Popularity (R = 0.16) (F = 7.68, df1 = 5, df2 = 1379, sig. at 1°/o)
$Y_{12} = 3.76 + 0.23X_4 + 0.13X_9 + 0.10X_1 - 0.05X_5 + 0.02X_{11}$

13. Unpopularity (R = 0.07) (F = 1.32, df1 = 5, df2 = 1379, not sig.)
$Y_{13} = 10.36 - 0.12X_9 + 0.10X_2 - 0.09X_{11} + 0.06X_3 + 0.04X_5$

14. Overall Popularity (R = 0.11) (F = 3.32, df1 = 5, df2 = 1379, sig. at 1°/o)
$Y_{14} = -7.04 + 0.23X_9 + 0.09X_{11} + 0.11X_8 - 0.11X_5 + 0.11X_1$

M. 9: REGRESSION MODELS FOR AFFECTIVE ASPECTS
(n = 899 boys)

11. Attitude (Comp.) (R = 0.45) (F = 45.75, df1 = 5, df2 = 893, sig. at 1°/o)
$Y_{11} = -0.69 + 0.03X_5 + 0.03X_{11} + 0.03X_7 + 0.03X_{10} + 0.02X_9$

12. Popularity (R = 0.12) (F = 2.68, df1 = 5, df2 = 893, sig. at 5°/o)
$Y_{12} = 5.48 + 0.16X_4 + 0.10X_9 + 0.08X_1 - 0.05X_5 + 0.05X_8$

13. Unpopularity (R = 0.05) (F = 0.46, df1 = 5, df2 = 893, not sig.)
$Y_{13} = 8.77 + 0.10X_4 - 0.06X_{10} + 0.06X_5 - 0.05X_1 + 0.04X_3$

14. Overall Popularity (R = 0.08) (F = 1.16, df1 = 5, df2 = 893, not sig.)
$Y_{14} = -3.60 + 0.14X_9 + 0.13X_1 - 0.09X_5 + 0.16X_8 - 0.11X_{12}$

M. 10: REGRESSION MODELS FOR AFFECTIVE ASPECTS
(n = 486 girls)

11. Attitude (Comp.) (R = 0.38) (F = 16.55, df1 = 5, df2 = 480, sig. at 1°/o)
$Y_{11} = 0.63 + 0.02X_7 + 0.02X_5 + 0.03X_{11} + 0.01X_1 - 0.01X_6$

12. Popularity (R = 0.23) (F = 5.20, df1 = 5, df2 = 480, sig. at 1°/o)
$Y_{12} = 1.09 + 0.27X_4 + 0.16X_1 + 0.12X_9 + 0.09X_{12} - 0.05X_5$

13. Unpopularity (R = 0.13) (F = 1.71, df1 = 5, df2 = 480, not sig.)
$Y_{13} = 10.24 - 0.26X_9 + 0.19X_2 - 0.13X_{11} + 0.12X_1 + 0.13X_6$

14. Overall Popularity (R = 0.16) (F = 2.73, df1 = 5, df2 = 480, sig. at 5°/o)
$Y_{14} = -7.54 + 0.37X_9 + 0.20X_{11} - 0.11X_5 + 0.17X_{12} - 0.14X_6$

From Tables M5 to M10, it can be seen that for general attitude to home, the most dominating single predictor variable for the total sample is X_{10} ('father rational'). However for boys alone it is X_5 ('father democratic') and for girls X_{11} ('mother rational'). The other predictors common to all the three samples are X_1 ('father concerned') and X_7 ('mother democratic'). This seems to suggest that paternal rational discipline has the overall greatest influence on the attitude of students towards home, and that paternal democratic teaching and maternal rational discipline have greater influence on boys and girls respectively. Paternal concerned treatment and maternal democratic teaching are the next most important factors contributing to the prediction of students' attitude to home. The projective Composition Test results show that X_5 ('father democratic') is the most important factor for both the whole sample and the boys, and X_7 ('mother democratic') for the girls. We may note that there are no more than seven different variables appearing in the six regression equations. X_7 ('mother democratic'), X_{11} ('mother rational') appear in all six equations, X_5 ('father democratic') and X_{10} ('father rational') in five, X_1 ('father concerned') in four. These variables fill all the first four positions in the regression equations.

Putting these findings together it may therefore be concluded that rational discipline and democratic teaching of both parents have overall importance in forming favourable attitudes towards home. This conclusion may be regarded as significant in terms of our total enquiry for it highlights factors which may be crucial in the changing milieu of the typical Chinese family in modern Hong Kong.

The multiple correlation coefficients for 'affiliation attitude' are highest, ranging from 0.56 to 0.64. This shows that parental variables influence 'affiliation' to a greater extent than all other affective attributes. The most dominating single predictor variable is X_{10} ('father

rational') for the total, boy, and girl samples. The next important predictor variable for the total and boy samples is X_7 ('mother democratic') while for girls it is X_{11} ('mother rational'). X_{10} ('father rational'), X_7 ('mother democratic'), X_{11} ('mother rational') and X_5 ('father democratic') appear in all three regression equations. This appears to confirm that parental rational and democratic factors are conducive to the formation of an affiliative attitude towards home.

The multiple correlation coefficients for 'frustration attitude' are next highest, ranging from 0.49 to 0.54. This shows that parental variables influence 'frustration' to a great extent. The predictor variables common to all the three regression equations for total, boy, and girl samples are X_1 ('father concerned'), X_{10} ('father rational') and X_{11} ('mother rational'). While 'father concerned' dominates in the total and the girl regression equations, 'father rational' appears to be more important for boys.

In all three 'social interest' regression equations, X_5 ('father democratic') is the most important predictor. X_7 ('mother democratic') is the next most important for total and boys, while X_2 ('father restricted') has a strong effect on girls. The regression equations for the criterion variable 'affiliation interest' show that X_5 ('father democratic'), X_6 ('father demanding') and X_{12} ('mother autocratic') are important parental factors. This holds for both total and boys, but for girls, X_{10} ('father rational'), X_{11} ('mother rational') and X_3 ('mother concerned') seem to be the dominating factors. The regression equations for the criterion variable 'individuality interest' show that X_8 ('mother demanding') and X_{12} ('mother autocratic') are common in all equations, though for total and boys, X_9 ('father autocratic') is the most influential factor while for girls, X_6 ('father demanding') takes first place. It should be pointed out that the multiple correlation for boys is not significant, which suggests that parental variables may have little or

no effect on 'individuality interest' in boys.

For 'academic motivation', X_7 ('mother democratic') is most influential for total and girls, but X_5 ('father democratic') has more influence for boys. For the three factors of academic motivation, X_1 ('father concerned') appears in all nine regression equations; this predictor takes the first position in every case except 'intrinsic motives' for boys, where X_3 ('mother concerned') appears first in the equation. For the 'school work' factor, the other parental variables which appear in all three equations are X_{11} ('mother rational') and X_{12} ('mother autocratic'). For 'intrinsic motives', the other parental variable which appears in all three equations is X_6 ('father demanding'). For 'incentive', the other parental variables which show in all three equations are X_{11} ('mother rational'), X_4 ('mother restricted'), and X_{12} ('mother autocratic').

For 'popularity', X_4 ('mother restricted'), X_9 ('father autocratic'), X_1 ('father concerned'), and X_5 ('father democratic') appear in the equations for total, boy and girl samples. However, with overall popularity (i.e., when unpopularity is also taken into account), only X_9 ('father autocratic'), and X_5 ('father democratic') remain in all three regression equations. It should also be pointed out that the multiple correlation for boys is not significant, which seems to suggest that parental variables have little or no effect on overall popularity in boys.

M. 11: REGRESSION MODELS FOR ACHIEVEMENTS
(n = 155 boys)

1. English (R = 0.37) (F = 4.70, df1 = 5, df2 = 149, sig. at 1°/o)

$$Y_1 = 48.84 + 0.77X_4 + 0.32X_1 - 0.20X_7 - 0.15X_5 + 0.08X_{11}$$

2. Science (R = 0.36) (F = 4.58, df1 = 5, df2 = 149, sig. at 1°/o)

$$Y_2 = 40.76 + 1.04X_4 - 0.33X_{11} + 0.46X_1 - 0.30X_7 - 0.26X_9$$

3. Mathematics (R = 0.32) (F = 3.45, df1 = 5, df2 = 149, sig. at 1°/o)

$$Y_3 = 51.23 + 1.24X_4 - 0.43X_7 + 0.66X_1 - 0.70X_2 - 0.32X_3$$

4. Overall Achievement (R = 0.38) (F = 4.90, df1 = 5, df2 = 149, sig. at 1°/o)

$$Y_4 = 50.21 + 0.75X_4 - 0.26X_7 + 0.34X_1 - 0.16X_3 - 0.13X_9$$

From the above results, it can be seen that X_4 (mother restricted treatment) has the greatest association with boys' achievements. X_1 (father concerned treatment) and X_7 (mother democratic teaching) are next most important in the academic success of their sons. On the whole, mother appears to play a more important role in the family than father in influencing school results of the boys. In Hong Kong, mothers tend to watch the boys' homework more closely than fathers and this would no doubt help the boys in their school success. The above findings correspond closely to those for intellectual abilities (p. 206), and also appear to be in accordance with the general tendency in Chinese families for mothers to impose more restriction on boys because of their importance in society, but this is shown here to tend to hinder the boys' achievement.

M. 12: REGRESSION MODELS FOR ACHIEVEMENTS
(n = 133 girls)

1. English (R = 0.27) (F = 2.06, df1 = 5, df2 = 127, not sig.)

$$Y_1 = 52.43 + 0.23X_9 + 0.18X_5 - 0.13X_3 - 0.17X_6 + 0.13X_2$$

2. Science (R = 0.29) (F = 2.34, df1 = 5, df2 = 127, sig. at 5°/o)

$$Y_2 = 65.76 - 0.21X_3 + 0.37X_{10} - 0.18X_{11} - 0.39X_6 + 0.18X_9$$

3. Mathematics (R = 0.33) (F = 3.14, df1 = 5, df2 = 127, sig. at 5°/o)

$$Y_3 = 66.72 - 0.28X_3 + 0.95X_{10} - 0.36X_5 - 0.34X_{11} - 0.29X_6$$

4. Overall Achievement (R = 0.31) (F = 2.70, df1 = 5, df2 = 127, sig. at 5°/o)

$$Y_4 = 59.96 + 0.14X_9 - 0.20X_3 + 0.30X_4 + 0.17X_{10} - 0.13X_{11}$$

The above results show that of the four achievement multiple correlations, one was found not significant and three were found significant at only 5°/o, whereas in boys all four results were found significant at 1°/o level. It is also noted that X_3 (mother concerned treatment) has the greatest association with the girls' achievements. X_9 (father autocratic discipline) and X_{10} (father rational discipline) are the next most important factors.

It can be seen that parents play a less important part in influencing achievement in girls than in boys. This finding is interesting because in Hong Kong, this fact would appear to be particularly true; much emphasis is placed on the education of the boys, and the girls are considered to be able to depend on their husbands in the future. These male-biassed concepts and practices still exist in Hong Kong Chinese families, though perhaps less so now than previously.

M. 13: REGRESSION MODELS FOR ACHIEVEMENTS IN RELATION TO ALL VARIABLES (n = 155 boys)

1. English (R = 0.60) (F = 16.61, df1 = 5, df2 = 149, sig. at 1°/o)
$Y_1 = 33.24 + 0.44X_{26} + 0.73X_5 + 0.30X_{34} + 0.09X_{35} - 0.12X_8$
2. Science (R = 0.64) (F = 20.96, df1 = 5, df2 = 149, sig. at 1°/o)
$Y_2 = 6.64 + 1.06X_{24} + 0.60X_{23} - 0.49X_{12} + 0.69X_5 + 0.49X_{25}$
3. Mathematics (R = 0.57) (F = 14.55, df1 = 5, df2 = 149, sig. at 1°/o)
$Y_3 = 20.33 + 0.92X_{26} + 0.52X_{21} - 0.50X_{12} + 0.67X_5 - 0.32X_{15}$
4. Overall Achievement (R = 0.69) (F = 27.35, df1 = 5, df2 = 149, sig. at 1°/o)
$Y_4 = 34.59 + 0.53X_{26} + 0.38X_{23} - 0.30X_{12} + 0.50X_5 - 0.11X_{19}$

Note: Numbering of independent variables is same as Tables 52, 55.

From the above regression equations, it can be seen that X_{26} (verbal+numerical ability) is the most important factor for success in English, mathematics and overall achievement, whereas X_{24} (verbal ability) is most important for science success. In other words, in Hong Kong both verbal+numerical and verbal abilities contribute most to academic success for boys. Other factors which contribute to prediction are X_{23} (incentive), X_5 (mother restricted treatment) and X_{12} (mother rational discipline), in decreasing order of importance.

M. 14: REGRESSION MODELS FOR ACHIEVEMENTS IN RELATION TO ALL VARIABLES (n = 133 girls)

1. English (R = 0.45) (F = 6.45, df1 = 5, df2 = 127, sig. at 1°/o)
$Y_1 = 35.13 + 0.78X_{24} + 0.20X_{10} + 0.21X_6 + 0.13X_{34} - 0.17X_8$
2. Science (R = 0.48) (F = 7.53, df1 = 5, df2 = 127, sig. at 1°/o)
$Y_2 = 85.36 - 0.23X_1 + 0.20X_{27} + 0.29X_{16} - 0.32X_{12} + 0.14X_{34}$
3. Mathematics (R = 0.43) (F = 5.60, df1 = 5, df2 = 127, sig. at 1°/o)
$Y_3 = 61.98 - 0.18X_1 + 0.36X_{27} + 0.38X_{16} - 0.38X_4 + 0.21X_{34}$
4. Overall Achievement (R = 0.54) (F = 10.49, df1 = 5, df2 = 127, sig. at 1°/o)
$Y_4 = 92.17 - 0.19X_1 + 0.18X_{34} - 0.37X_{15} + 0.24X_{19} + 0.11X_{16}$

Note: Numbering of independent variables is same as Tables 52, 55.

The above results show that X_{24} (verbal ability) is the dominant factor in girls for success in English, and X_1 (age) seems to have the most important (negative) bearing on success in science, mathematics, and overall achievement. For girls, the next most important factors are X_{34} (popularity), and X_{16} (academic motivation), in decreasing order of importance.

5. Test of Hypothesis III

The purpose in applying the analysis of variance technique in this section of the enquiry is to test the significance of the differences between the means of the father and mother groups in each of the respective fifteen, fourteen, and fifteen semantic differential items of the three main areas of parental behaviour: treatment, teaching, and discipline. Multivariate analysis is also employed to discover the overall parental difference in treatment, teaching, and discipline in terms of the data and in conformity with the wider purposes of this investigation.

Table 73: ANOVA IN "TREATED" (BETWEEN PARENTS)

"Treated"	Father Mean	S.D.	Mother Mean	S.D.	F (df = 1, 2814)	Sig.
1. warm - cold	5.75	1.40	6.10	1.28	48.28	1%
2. stern - mild	4.23	1.74	4.39	1.87	5.66	5%
3. relaxed - tense	4.19	1.55	4.22	1.66	0.22	NO
4. hard - soft	4.58	1.75	5.18	1.75	81.17	1%
5. ridicule - praise	4.30	1.42	4.49	1.48	13.21	1%
6. lenient - severe	4.01	1.50	4.08	1.60	1.22	NO
7. skilfully - awkwardly	4.73	1.45	4.91	1.52	9.76	1%
8. insensitive - sensitive	4.38	1.55	5.02	1.56	5.67	5%
9. justly - unjustly	5.13	1.58	4.98	1.64	6.04	5%
10. punishment - reason	4.84	1.85	4.35	1.86	47.42	1%
11. consistent - inconsistent	4.64	1.26	4.59	1.26	1.39	NO
12. encouraged - discouraged	5.63	1.42	5.51	1.47	5.16	5%
13. concerned - indifferent	4.91	1.55	5.12	1.54	12.95	1%
14. critical - praised	4.00	1.44	4.18	1.52	10.19	1%
15. close - distant	5.03	1.71	5.81	1.46	171.08	1%

Multivariate: F = 28.94, df = 15, 2800, significant at 1%.

Note: High-scoring pole in each item is underlined.

From the above findings, it can be seen that on the whole, mothers tend to be significantly better than fathers in their treatment of children. Mothers are evidently warmer, milder, softer, more skilful, sensitive, concerned, praising and particularly closer, though they are less just, reasonable, and encouraging than fathers. It is also noted that there are no significant parental differences in their relaxedness, leniency, and consistency.

Table 74: ANOVA IN "TAUGHT" (BETWEEN PARENTS)

"Taught"	Father Mean	S.D.	Mother Mean	S.D.	F (df = 1, 2814)	Sig.
1. often discussed - rarely discussed	4.31	1.92	4.62	1.84	19.15	1%
2. disagreeing discouraged - disagreeing encouraged	3.89	1.55	3.86	1.61	0.28	NO
3. supported - criticized	2.60	1.61	2.78	1.64	8.01	1%
4. skilful - awkward	4.97	1.61	4.77	1.67	10.94	1%
5. stern - mild	4.17	1.62	4.47	1.69	24.52	1%
6. often together - rarely together	4.11	1.78	4.58	1.72	52.12	1%
7. easy to irritate - hard to irritate	3.74	1.44	3.57	1.51	9.66	1%
8. tense - relaxed	3.75	1.50	3.68	1.61	1.29	NO
9. soft - hard	4.34	1.71	5.00	1.72	104.79	1%
10. always right - admit mistakes	3.71	1.69	3.64	1.64	1.21	NO
11. understood - did not understand	4.58	1.75	5.02	1.76	44.78	1%
12. impatient - patient	4.56	1.74	4.72	1.77	5.55	5%
13. criticized - praised	3.31	1.53	3.30	1.61	0.00	NO
14. pleased on my own - displeased	4.97	1.50	4.95	1.57	0.15	NO

Multivariate: F = 20.20, df = 14, 2801, significant at 1%.

Note: High-scoring pole in each item is underlined.

From the above findings, it can be seen that on the whole, and according to these data, mothers are significantly better than fathers in their teaching of children. It appears that mothers tend to discuss things more often with children, support their mistakes, and mothers and children often do things together. They seem (according to this evidence) to understand the children better. They are milder, softer, and more patient, though less skilful in teaching new things and easier to irritate than fathers.

Table 75: ANOVA IN "DISCIPLINED" (BETWEEN PARENTS)

"Disciplined"	Father Mean	Father S.D.	Mother Mean	Mother S.D.	F (df = 1, 2814)	Sig.
1. often punished - rarely punished	4.28	1.72	4.17	1.76	2.47	NO
2. hard - soft	4.02	1.72	4.68	1.71	104.53	1%
3. always explained - rarely explained	5.18	1.65	5.06	1.62	4.35	5%
4. persuaded - ordered	4.24	1.69	4.56	1.67	24.46	1%
5. angry - calm	3.24	1.77	3.19	1.72	0.51	NO
6. lenient - severe	3.73	1.41	3.91	1.39	11.07	1%
7. easy to irritate - hard to irritate	3.72	1.40	3.51	1.37	16.27	1%
8. feel guilty - feel resentment	4.45	1.52	4.45	1.58	0.00	NO
9. as parent wished - know the rules	3.38	1.85	3.38	1.81	0.00	NO
10. mild - stern	4.13	1.48	4.35	1.51	15.37	1%
11. reasonable - unreasonable	5.17	1.47	5.07	1.48	3.34	NO
12. strict - permissive	3.91	1.55	4.12	1.51	13.71	1%
13. resisted - yielded	4.03	1.50	4.02	1.53	0.01	NO
14. run away - with family	5.06	1.77	5.28	1.71	11.78	1%
15. blamed myself - blamed parent	4.59	1.44	4.69	1.42	3.02	NO

Multivariate: F = 17.71, df = 15, 2800, significant at 1%.

Note: High-scoring pole in each item is underlined.

From the above findings, it can be seen that on the whole, mothers are significantly better than fathers in matters relating to their discipline of children. Mothers tend to be more persuasive, lenient, mild, permissive, and particularly soft, though they rarely explain their punishment and are more easily irritated than fathers. It should also be noted

that there are no significant parental differences in frequency of punishment, in their anger during punishment, their expectation of the child's behaviour, and their reasonableness, and that the children have the same reactions to punishment or discipline irrespective of which parent is involved in administering the discipline.

6. Test of Hypothesis IV

Analysis of variance technique is used here to test the significance of school differences in cognitive abilities, attitude to home, social interest and academic motivation. Again, multivariate analysis is employed to discover the overall difference for the above aspects of investigation.

Table 76: ANOVA IN COGNITIVE ABILITIES (BETWEEN SCHOOLS)

Cognitive Abilities	School Means 1	2	3	4	5	6	7
1. Verbal	18.85	17.62	18.45	18.86	16.03	11.78	10.37
2. Numerical	18.11	16.08	18.25	18.29	15.32	9.46	10.83
3. Verbal+ Numerical	36.96	33.70	36.71	37.15	31.35	21.24	21.05
4. Non-Verbal	57.28	57.44	51.78	54.14	50.49	38.42	41.80
5. General Intelligence	94.04	91.18	88.49	91.29	81.85	59.06	63.00

Cognitive Abilities	School Means 8	9	10	11	12	13	14
1. Verbal	14.88	12.29	13.11	14.40	12.25	11.81	12.61
2. Numerical	12.98	8.96	11.59	12.42	11.71	8.94	11.74
3. Verbal+ Numerical	27.85	21.12	24.70	26.63	23.91	20.82	23.93
4. Non-Verbal	49.15	44.36	47.48	48.23	44.88	44.10	42.02
5. General Intelligence	77.00	65.12	72.00	75.06	68.83	64.72	65.91

Cognitive Abilities	F (df = 13, 1376)	Significance
1. Verbal	60.27	1%
2. Numerical	68.73	1%
3. Verbal+Numerical	80.29	1%
4. Non-Verbal	33.67	1%
5. General Intelligence	68.43	1%

(Multivariate: F = 16.26, df = 65, 6488, significant at 1%)

Table 77: ANOVA IN "ATTITUDE TO HOME" (BETWEEN SCHOOLS)

Attitute to Home	School Means 1	2	3	4	5	6	7
1. Sentence Completion	62.25	70.40	68.96	64.39	62.24	65.46	65.51
2. Affiliation (Likert)	66.68	68.42	69.70	66.35	69.50	65.32	67.76
3. Frustration (Likert)	38.39	39.98	41.13	39.48	38.58	35.68	36.17
4. Composition	2.96	3.20	3.29	3.14	3.19	3.40	3.27

Attitude to Home	School Means 8	9	10	11	12	13	14
1. Sentence Completion	62.98	65.97	69.34	67.47	64.06	66.33	67.09
2. Affiliation (Likert)	66.71	71.23	71.36	69.35	67.89	70.48	72.07
3. Frustration (Likert)	37.88	37.35	38.61	38.41	37.65	37.08	38.86
4. Composition	2.97	3.47	3.32	3.19	3.14	3.39	3.09

Attitute to $H_o$me	F (df = 13, 1394)	Significance
1. Sentence Completion	5.11	1%
2. Affiliation (Likert)	2.82	1%
3. Frustration (Likert)	4.60	1%
4. Composition	1.74	5%

(Multivariate: F = 4.65, df = 52, 5389, significant at 1%)

Table 78: ANOVA IN "SOCIAL INTEREST" (BETWEEN SCHOOLS)

Social Interest	School Means 1	2	3	4	5	6	7
1. Sentence Completion	45.94	49.52	46.62	47.18	48.46	51.14	49.29
2. Affiliation (Likert)	65.14	66.44	64.73	66.64	66.42	65.14	67.39
3. Individuality (Likert)	30.16	30.26	31.56	30.90	30.49	29.84	30.44

Social Interest	School Means 8	9	10	11	12	13	14
1. Sentence Completion	48.28	48.47	49.45	49.66	47.73	49.69	50.93
2. Affiliation (Likert)	67.18	66.49	65.93	63.63	66.56	66.27	65.84
3. Individuality (Likert)	31.90	30.58	31.66	31.40	31.27	31.53	30.30

Social Interest	F (df = 13, 1394)	Significance
1. Sentence Completion	5.60	1%
2. Affiliation (Likert)	2.67	1%
3. Individuality (Likert)	2.38	1%

(Multivariate: F = 3.93, df = 39, 4123, significant at 1%)

Table 79: ANOVA IN "ACADEMIC MOTIVATION" (BETWEEN SCHOOLS)

Academic Motivation	School Means 1	2	3	4	5	6	7
1. Sentence Completion	60.31	60.10	61.09	60.86	62.61	63.48	60.56
2. School Work (Likert)	41.75	37.32	42.72	40.70	39.86	37.36	37.51
3. Intrinsic Motives (Likert)	32.17	31.24	31.91	32.11	31.67	21.30	30.51
4. Incentive (Likert)	25.77	24.44	25.40	25.17	25.72	24.84	23.80

Academic Motivation	School Means 8	9	10	11	12	13	14
1. Sentence Completion	59.17	60.82	63.86	62.82	60.47	62.31	64.16
2. School Work (Likert)	38.46	37.42	39.13	39.52	41.87	38.00	40.77
3. Intrinsic Motives (Likert)	31.02	30.69	31.16	31.74	31.61	31.35	33.37
4. Incentive (likert)	24.29	23.90	25.63	24.95	25.43	24.59	26.37

Academic Motivation	F (df = 13, 1394)	Significance
1. Sentence Completion	3.43	1%
2. School Work (Likert)	3.26	1%
3. Intrinsic Motives (Likert)	2.77	1%
4. Incentive (Likert)	3.49	1%
(Multivariate: F = 2.94, df = 52, 5389, significant at 1%)		

Tables 76 to 79 show that

(1) there are very significant school differences for all intellectual abilities of students;

(2) there are significant school differences for students' attitude to home;

(3) there are significant school differences for students' social interest;

(4) there are significant school differences for students' academic motivation.

It is also of interest to note the range of school differences in the various cognitive and affective attributes:

Table 80: RANGE OF SCHOOL DIFFERENCES IN PSYCHOLOGICAL VARIABLES

Psychological Variables	Maximum	Highest Mean	Lowest Mean	°/o Difference
1. Verbal	32	18.86	10.37	26.5
2. Numerical	33	18.29	8.94	28.3
3. Verbal+Numerical	65	37.15	20.82	25.1
4. Non-Verbal	65	57.44	38.42	29.2
5. General Intelligence	130	94.04	59.06	26.9
6. Attitude to Home	100	70.40	62.24	8.2
7. Affiliation Attitude	105	72.07	65.32	6.4
8. Frustration Attitude	55	41.13	35.68	9.9
9. Attitude (Composition)	5	3.47	2.96	10.2
10. Social Interest	75	51.14	45.94	8.3
11. Affiliation Interest	95	67.39	63.63	4.0
12. Individuality Interest	55	31.90	29.84	2.3
13. Academic Motivation	90	64.16	59.17	5.5
14. School Work	55	42.72	37.32	9.8
15. Intrinsic Motives	45	33.37	21.30	26.8
16. Incentive	35	26.37	23.90	7.1

From the table, it can be seen that the range of school differences is highest for intellectual abilities and intrinsic motives, all having percentage difference of over 25°/o.

Summing up

This chapter advances our enquiry to the extent that the statistical techniques adopted in the analyses of the present data seem appropriate, and they yielded intelligible findings. Moreover, the stepwise multiple regression results match up rather nicely with those of product-moment correlation; and similar abilities and attributes also fall into psychologically meaningful groups in the factor analyses. The analyses of variance and covariance results also appear to be reasonable. On the whole, we may say that the main purposes of this study have been achieved in that the hypotheses have been duly tested. There remains the closer scrutiny of the results in terms of their implications for education in the particular cultural context of Hong Kong.

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CHAPTER NINE

RESULTS AND DISCUSSION

Turn now to the results of this study. First, the statistics from the earlier analyses may be summarised in table form for ease of reference and discussion. These summary tables are brief, but contain all the essential findings. When reading the tables, it should be particularly noted that the favourable pole of all the variables has the higher scores, except in the case of unpopularity.

1. The Relations of Parental and Other Variables

Table 81: SIGNIFICANCE OF RELATIONSHIPS BETWEEN PARENTAL VARIABLES AND OTHER PSYCHOLOGICAL VARIABLES

(p values are given)

Psychological Variables	Parental Variables											
	Fath Conc	Fath Rest	Moth Conc	Moth Rest	Fath Demo	Fath Dema	Moth Demo	Moth Dema	Fath Auto	Fath Rati	Moth Rati	Moth Auto
1. Verbal	0.01	0.01	0.05	0.01	....	....	....	....	0.01	....	....	0.05 (-)
2. Numer.	0.01	0.01	....	0.01	0.05 (-)	....	....	....	....	....	....	0.01 (-)
3. Verbal+ Numer.	0.01	0.01	....	0.01	0.05 (-)	....	0.05 (-)	0.05	....	....	....	0.01 (-)
4. Non-Verb.	0.01	0.05	....	0.01	....	....	....	....	....	....	....	0.01 (-)
5. Gen. Intel.	0.01	0.01	....	0.01	....	....	....	0.05	....	....	....	0.01 (-)
6. Att. to Home	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
7. Att. (Comp.)	0.01	0.05	0.01	....	0.01	....	0.01	....	0.01	0.01	0.01	0.01
8. 'Aff. Att.'	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
9. 'Frus. Att.'	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
10. Soc. Int.	0.01	....	0.01	....	0.01	....	0.01	....	....	0.01	0.01	0.05
11. 'Aff. Int.'	....	....	0.05	....	0.01	....	0.01	....	....	0.01	....	....
12. 'Ind. Int.'	....	....	....	....	....	....	....	....	0.05	....	....	....

(to be continued on next page)

Table 81: SIGNIFICANCE OF RELATIONSHIPS BETWEEN PARENTAL VARIABLES AND OTHER PSYCHOLOGICAL VARIABLES (CONT'D)

(p values are given)

Psychological Variables	Parental Variables											
	Fath Conc	Fath Rest	Moth Conc	Moth Rest	Fath Demo	Fath Dema	Moth Demo	Moth Dema	Fath Auto	Fath Rati	Moth Rati	Moth Auto
13. Aca. Mot.	0.01	....	0.01	....	0.01	....	0.01	....	....	0.01	0.01	0.05
14. 'Sch. Work'	0.01	....	0.05	....	0.05	....	....	....	....	0.01	0.05	....
15. 'Intrin. Mot.'	0.01	....	0.01	0.01	.....	....	....	....	....	0.05	0.01	....
16. 'Incen.'	0.01	0.01	0.01	0.01	0.01	....	0.01	....	0.05	0.01	0.01	....
17. Pop.	0.01	0.05	0.05	0.01	....	....	....	....	0.01	....	....	....
18. Unpop.	....	....	....	....	....	....	....	....	....	....	....	....

Note: 1. (-) indicates negative relationship.

2. 1-5 -- AH4 Test; 6, 10, 13 -- Sentence Completion Test; 7 -- Composition Test; 8, 9 -- attitude factors; 11, 12 -- interest factors; 14-16 -- motivation factors; 17, 18 -- Popularity Test.

Four major parental factors are identified to have significant relationships with all the intellectual abilities as measured by the AH4 Test. They are the 'father concerned', 'father restricted', 'mother restricted', and 'mother autocratic'. In other words, fathers should be more concerned and less restrictive, and mothers should be less restrictive but more autocratic for the child's better intellectual development. This seems to indicate that intellectually superior students tend to have fathers who are warm, encouraging, close, consistent, just, mild, soft, relaxed, and lenient in treating their children; and also to have mothers who are mild, soft, relaxed, and lenient in their treatment, but on the other hand, who may be stern, hard, severe, strict and also who may impose frequent punishment in terms of their disciplinary methods. This finding (that the

mother plays a more important role in disciplining their children) and that more autocratic discipline seems to be more favourable to intellectual development is understandable if the traditional Hong Kong situation is taken fully into account. In Hong Kong in general, and more particularly in the middle- and higher-income groups, mothers usually stay at home to look after their children while fathers go to work, hence the mothers can be expected to have more opportunities to exert a disciplinary influence on their children. Moreover, the autocratic mothers tend to give their children a more regular and steady programme of book work and other exercises, and hence such constant brain exercise indirectly helps their children's intellectual progress, and mother autocratic home appears more intellectually stimulating in Hong Kong. On the other hand, the results could be interpreted for the Hong Kong situation in a way to suggest that the mothers show a considerable interest in their children's success in the future, and hence strict measures and pressures to succeed could have helped indirectly the full development of their children's intelligence. This is in line with the current literature as reviewed in Chapter Two showing that intellectually superior children tend to have parents who show interest in their intellectual development by exerting pressures to succeed and assistance in doing so. Thus the favourable effect of mother autocracy could be ascribed to social and cultural pressures in Hong Kong where (as was pointed out earlier) school life can be very competitive. It is also noted that parental democratic teaching seems to have a negative effect on the development of numerical and verbal+numerical abilities. Again this can be attributed to the social and cultural pattern of Hong Kong: Chinese students have long been used to the less democratic type of teaching; in other words, the traditional method still prevails in most homes (and admittedly in many schools also); to attempt to employ what may be termed a democratic way of teaching might take some time for the children to get

accustomed, and during this adjustment period, some confusion and adverse effect on their intellectual growth might be expected.

The overall results also suggest that parental treatment is most highly related to intellectual abilities while parental teaching is the least related. This indicates that the way the child is treated may be more important for intellectual development than how he is taught or disciplined. This again has some local cultural implications -- Most people who are familiar with Hong Kong would agree that in Hong Kong most parents put enough emphasis on teaching and disciplining their children, but perhaps do not pay much attention to treating their children favourably or in an encouraging manner. Hence, the relation between parental treatment and children's intelligence appears to be more significant in such circumstances. However, the possibility of genetic influence may not be entirely ruled out, since it is possible that children with high intellectual abilities have parents with high intellectual abilities, who are also more likely to show such behaviour. This caution also applies to the similar interpretations later.

All the parental variables have significant relationships at the 1% level of confidence, with students' 'attitude to home' and also the attitude factors 'affiliation' and 'frustration'. These results are in accordance with the findings of other investigators and may be accepted with some confidence. Since parents have so much to do with children's attitude towards home, it seems important that they should pay special attention to treating, teaching, and disciplining their children in desirable ways. This is particularly relevant in the Hong Kong situation where most parents like their children to observe the ancient Chinese virtue of filial piety and to maintain close affectionate family ties with them, though some of the parents may not know that the way they interact

with their children largely determines whether the children will love their parents. This is so much so (at times) that they prefer to stay or to keep close contact with their parents even after they get married -- although housing problems and economic factors are also sometimes a consideration.

'Social interest' and its factor 'affiliation' have generally significant relationships with favourable parental behaviour, i.e., 'concerned', 'democratic', and 'rational'. This is in good accordance with the socialisation process as explained by various psychologists and sociologists, and as reviewed in Chapter Two. The three parental factors 'concerned', 'democratic', and 'rational' can give the children greater confidence in people and thus tend to make them friendlier, more open with others, and also better able to get along with their peers.

'Academic motivation' and its factors 'school work', 'intrinsic motives', and 'incentive' again have generally significant relationships with the favourable parental factors 'concerned', 'democratic', and 'rational'. Once more, this finding agrees generally with other research reports and particularly with those reviewed in Chapter Two. It should be pointed out that Hong Kong students are rather better motivated than many of those in other places; it is thus of interest to see that the favourable parental factors have their positive influence on children's motivation.

As the distribution of the popularity scores is rather skewed, the significant relationships of popularity and parental scores should be interpreted with considerable caution. However, the generally significant correlation of popularity and parental treatment seems reasonable and may be accepted. Unpopularity, however, fails to show any significant relationships with all parental variables.

Table 82: SIGNIFICANCE OF RELATIONSHIPS BETWEEN PARENTAL VARIABLES AND ACHIEVEMENT VARIABLES (BOYS)
(p values are given)

Achievement Variables	Parental Variables											
	Fath Conc	Fath Rest	Moth Conc	Moth Rest	Fath Demo	Fath Dema	Moth Demo	Moth Dema	Fath Auto	Fath Rati	Moth Rati	Moth Auto
1. English	0.05	....	....	0.01	....	....	....	0.05	....	....	....	....
2. Science	0.05	....	....	0.01	....	....	....	....	....	....	....	....
3. Math.	....	....	....	....	....	....	....	....	....	....	....	....
4. Overall Achi.	0.05	....	....	0.01	....	....	....	....	....	....	....	....

Table 83: SIGNIFICANCE OF RELATIONSHIPS BETWEEN PARENTAL VARIABLES AND ACHIEVEMENT VARIABLES (GIRLS)
(p values are given)

Achievement Variables	Parental Variables											
	Fath Conc	Fath Rest	Moth Conc	Moth Rest	Fath Demo	Fath Dema	Moth Demo	Moth Dema	Fath Auto	Fath Rati	Moth Rati	Moth Auto
1. English	....	....	....	....	0.05	....	....	....	0.05	....	....	....
2. Science	....	....	....	....	....	....	....	....	....	....	....	....
3. Math.	....	....	....	....	....	....	....	....	....	....	....	....
4. Overall Achi.	....	....	....	....	....	....	....	....	0.05	....	....	....

It seems on the present evidence that students' achievement is not much influenced by parental variables. In view of the over-emphasis on the importance of achievements (i.e., examinations) by both parents and students in the Hong Kong school situation, it is most likely that parents in Hong Kong are already operating well above the level where variations of treatment, teaching, and discipline are likely to have any marked effect on achievements. This would explain the low correlations shown in this study. It seems likely that other variables -- intellectual, socio-economic, and school differences, would exert more influence on achievements. In fact, it was

found that for boys there are reasonable correlations (at the 1°/o level of confidence) between verbal, numerical, verbal+numerical, and general intelligence; and English, science, mathematics, and overall achievement (Table 54, p. 184). For girls, the academic subjects were found to be related to particular intellectual abilities at various levels of significance (Table 57, p. 188).

The previous three Tables 81-83 suggest that Hypothesis I which states that "there are significant relationships between parental behaviour, and children's verbal, numerical, non-verbal, and general intelligence, attitude, interest, motivation, popularity, and achievements" is only partially proved. Quite a number of the relationships in these tables are found to be statistically insignificant or rather meaningless for present purposes.

2. Sex Differences in Various Variables

Table 84: SIGNIFICANCE OF SEX DIFFERENCES IN PSYCHOLOGICAL VARIABLES
(p values are given)

Psychological Variable	ANOVA	ANCOVA (all maternal variables as covariates)	ANCOVA (all paternal unfavourable variables as covariates)	ANCOVA (all parental favourable variables as covariates)	ANCOVA (all parental variables as covariates)
1. Verbal	- * (F = 3.39)	-	0.05 (F = 4.86)	-	-
2. Numer.	0.01 * (F = 11.88)	0.01 (F = 8.43)	0.01 (F = 13.98)	0.01 (F = 12.77)	0.01 (F = 9.85)
3. Verbal+ Numer.	0.01 * (F = 8.66)	0.05 (F = 5.64)	0.01 (F = 10.96)	0.01 (F = 9.49)	0.01 (F = 6.90)
4. Non-Verbal	0.01 * (F = 78.71)	0.01 (F = 69.79)	0.01 (F = 84.07)	0.01 (F = 83.10)	0.01 (F = 75.81)
5. General Intel.	0.01 * (F = 45.51)	0.01 (F = 38.64)	0.01 (F = 51.13)	0.01 (F = 49.13)	0.01 (F = 43.45)
6. Attitude to Home	0.01 (F = 7.00)	0.01 (F = 6.88)	-	0.01 (F = 6.97)	0.05 (F = 4.12)
7. Att. (Comp.)	-	-	-	-	-
8. 'Affiliation Attitude'	-	-	-	-	-
9. 'Frustration Attitude'	-	-	-	-	-
10. Social Interest	-	-	-	-	-
11. 'Affiliation Interest'	-	-	-	-	-
12. 'Individuality Interest'	-	-	-	-	-
13. Academic Motivation	0.05 (F = 5.80)	0.05 (F = 5.54)	0.05 (F = 3.98)	0.05 (F = 5.25)	0.05 (F = 4.91)
14. 'School Work'	-	-	-	-	-
15. 'Intrinsic Motives'	-	-	-	-	-
16. 'Incentive'	-	-	-	-	-
17. Popularity	0.05 (F = 4.05)	0.05 (F = 3.96)	-	-	-
18. Unpopularity	-	-	-	-	-

Note: * indicates boys superior.

There are highly significant differences (at the 1°/o level of confidence) between boys and girls in all intellectual abilities except verbal ability. This accords quite well with other related research findings, e.g., Vernon[1] (1960) stated that boys tend to do better on numerical ability and non-verbal tests. The question whether boys or girls are superior in verbal ability depends very much on the sample investigated, hence contrary findings have often been reported. Thus Vernon (1960) showed that girls are relatively superior on most verbal tests, while MacArthur, Irvine and Brimble[2] (1964) revealed that African boys perform appreciably better on vocabulary tests. Hence the present finding that boys are better (though not significantly so) than girls on the verbal test seems to add more to the inconclusiveness of the issue.

When the effect of all paternal unfavourable factors is removed, the F ratio for verbal ability becomes higher, suggesting that father's unfavourable behaviour, i.e., 'restricted', 'demanding', and 'autocratic' tend to reduce sex differences in verbal ability. It seems that the father plays a more important part than the mother in minimising sex differences. It may also be claimed that fathers are more consistent and impartial to boys and girls in their verbal training.

Furthermore, we find that when the effect of all maternal factors and all parental factors is removed respectively, the F ratios for numerical, verbal+numerical, non-verbal, and general intelligence are all lowered: this rather suggests that these two groups of factors are important contributors to the sex differences in the above intellectual areas. It is also noted that the F ratios for the former are smaller than those for the latter. This seems to indicate that maternal factors play a more important part in causing sex differences in the various intellectual abilities other than verbal. Such findings are in agreement with other judgments of the Hong Kong local situation where it is found that mothers

tend to pay more attention to the intellectual development of the boys, who are expected to support the family when they grow up.

On the other hand, when the effects of all paternal unfavourable factors and all parental favourable factors are removed in turn, the F ratios are all raised, implying that these two groups of factors help to reduce sex differences in numerical, verbal+numerical, non-verbal, and general intelligence. However, paternal unfavourable factors appear to be more important in minimising sex differences, since the F ratios have higher values in this case. Thus it seems appropriate to reiterate the point that fathers are more consistent and impartial towards sons and daughters in their verbal training and, based on the above additional evidence, in their encouragement of developing general intellectual abilities.

Turning to the general attitude to home, there is a significant sex difference at the 1°/o level (as measured by the Sentence Completion Test). This appears to have a cultural implication since most Chinese girls tend to be more affiliative than boys, whereas in some parts of the world girls might be found to be as independent as boys. When the effects of the three groups of factors (all maternal factors, all parental favourable factors, and all parental factors) are removed separately, the F ratios are lowered, the last group having the greatest lowering effect. Apparently, all father and mother behaviour, favourable and unfavourable, contribute to the sex difference in children's attitude towards home. Similarly, sex differences significant at the 5°/o level were found for academic motivation as measured by the Sentence Completion Test. This is in line with the common phenomenon in Hong Kong, namely that education for girls is generally less favoured, and girls staying on until an age around 17 are necessarily more motivated than the average boys.

Finally, no significant sex differences whatever in social interest were shown for boys and girls, though the girls were found to be significantly

higher than the boys in their popularity, and this significance is slightly lowered by removing the effect of all maternal factors. This seems to show that mother behaviour contributes to a small extent to sex difference in popularity. However, in view of the fact that social interest (or sociability) and popularity are difficult to define in terms of the Hong Kong cultural context, the present findings cannot be considered conclusive.

Table 85: SIGNIFICANCE OF SEX DIFFERENCES IN ACHIEVEMENTS

(p values are given)

Achievements	ANCOVA	ANCOVA (all maternal variables as covariates)	ANCOVA (all paternal unfavourable variables as covariates)	ANCOVA (all parental favourable variables as covariates)	ANCOVA (all parental variables as covariates)	ANCOVA (age and intellectual abilities as covariates)
1. English	-	-	-	-	-	-
2. Science	- *	-	-	-	-	-
3. Mathematics	0.01 * (F = 10.87)	0.01 (F = 10.81)	0.01 (F = 11.14)	0.01 (F = 9.57)	0.01 (F = 9.99)	0.05 (F = 5.92)
4. Overall Achievement	-*	-	-	-	-	-

Note: * indicates boys superior.

Regarding school achievements, there is a highly significant sex difference in mathematics in favour of the boys. Also boys were found to be better (though not significantly so) in science and overall achievements, but there was no sex difference in English. This is in reasonable agreement with a majority of the findings of others for sex differences in the various intellectual abilities. It has been shown that achievements have highly significant correlations with intellectual abilities. It is of interest to note that though boys are significantly better than girls in their intellectual abilities (as shown earlier), the sex differences in

science and overall achievement were found to be insignificant. A reason for this is that girls are more highly motivated than boys (otherwise they would not be in school at the age of about 17 in the Hong Kong situation), hence no marked superiority is shown by boys over the girls in science and overall achievement in spite of their superior ability.

When the effects of all maternal variables, all parental favourable variables, and all parental variables are removed separately, the F ratios are lowered, showing that these groups of variables are partly responsible for sex difference in mathematics. However, when the effect of both age and intellectual abilities together is removed, the F ratio is very much reduced --- in fact to nearly half of the ratio before removing the effect. This seems to imply that age and intellectual abilities contribute most of the sex difference in mathematics, and this is in agreement with the other evidence in this study. On the other hand, when the effect of all paternal unfavourable variables is removed, the F ratio is raised, and thus father restricted, demanding, and autocratic behaviour tends to reduce the sex difference in mathematics. In view of the necessary precautions pointed out by Gourlay[3] (1953) when interpreting results from analyses of covariance, the above interpretations should be accepted with some reservation.

The foregoing Tables 84-85 show that Hypothesis II which states that "there are significant differences between boys and girls in cognitive and affective attributes, and achievements" can only be partially accepted, since quite a number of the sex differences are found to be insignificant.

3. Multiple Regression Models

Having introduced the regression models for the cognitive and affective attributes as well as for achievements in the previous chapter, and also having compared the models for boys and girls as well as the total sample, we are now ready to bring into closer focus the essential experimental features of the various models. In Tables 86-89, the predictors or parental variables are represented as follows:

X_1 = 'father concerned'

X_2 = 'father restricted'

X_3 = 'mother concerned'

X_4 = 'mother restricted'

X_5 = 'father democratic'

X_6 = 'father demanding'

X_7 = 'mother democratic'

X_8 = 'mother demanding'

X_9 = 'father autocratic'

X_{10} = 'father rational'

X_{11} = 'mother rational'

X_{12} = 'mother autocratic'

Table 86: SIGNIFICANCE OF MULTIPLE R AND ORDER OF IMPORTANCE OF PARENTAL VARIABLES FOR PREDICTION OF OTHER PSYCHOLOGICAL VARIABLES

(p values are given for R)

Cognitive Attributes	Sample	R	First	Second	Third	Fourth	Fifth
	Total	0.01	X_4	$-X_{12}$	X_1	$-X_5$	$-X_7$
1. Verbal	Boy	0.01	X_4	X_1	$-X_5$	$-X_{12}$	X_{11}
	Girl	0.01	X_4	$-X_{12}$	X_6	X_2	$-X_5$
	Total	0.01	X_4	$-X_{12}$	X_1	$-X_5$	X_{11}
2. Numerical	Boy	0.01	X_4	$-X_{12}$	X_1	$-X_5$	$-X_9$
	Girl	0.01	X_4	$-X_{12}$	X_2	$-X_5$	X_1
	Total	0.01	X_4	$-X_{12}$	X_1	$-X_5$	X_2
3. Verbal+ Numerical	Boy	0.01	X_4	X_1	$-X_5$	$-X_{12}$	$-X_9$
	Girl	0.01	X_4	$-X_{12}$	X_2	$-X_5$	X_1
	Total	0.01	$-X_{12}$	X_4	X_1	$-X_5$	X_8
4. Non-Verbal	Boy	0.01	X_1	$-X_5$	X_{10}	$-X_{12}$	X_8
	Girl	0.01	X_4	$-X_{12}$	X_1	$-X_5$	X_9
	Total	0.01	X_4	$-X_{12}$	X_1	$-X_5$	X_8
5. General Intell-igence	Boy	0.01	X_1	$-X_5$	X_4	$-X_{12}$	X_{11}
	Girl	0.01	X_4	$-X_{12}$	X_2	$-X_5$	X_1

The multiple correlations for all the intellectual models were found to be significant at the 1% level of confidence. The two most important predictors are clearly X_4 ('mother restricted') and X_{12} ('mother autocratic'), and the two next important predictors are X_1 ('father concerned') and X_5 ('father democratic'). It should be noted that from Table 81 (p. 229) the

'mother restricted' and 'father concerned' factors are positively, while the 'mother autocratic' and 'father democratic' factors are negatively related to intellectual abilities. This suggests that for better intellectual development, mothers should be less restrictive but more autocratic, whereas fathers should be more concerned but less democratic. The above findings are similar to those already discovered or mentioned in the discussion on the relationships between the intelligence variables and parental variables. However, these regression models give a rather better understanding of the particular relationships involved by placing the parental variables in their order of importance for prediction of a particular ability for boys, girls, or for the general sample. It is also of interest to see that for boys, the paternal predictors X_1 ('father concerned') and X_5 ('father democratic') appear to be more important than the maternal predictors in relation to non-verbal and general intelligence, which reverses the order of importance found for other models. As pointed out by Vernon[4] (1969) and others, the democratic but demanding home climate encourages better intellectual progress. However, the Hong Kong situation is such that most parents are demanding and consequently in the experimental results presented, this factor does not stand out so prominently in the regression models.

Table 87: SIGNIFICANCE OF MULTIPLE R AND ORDER OF IMPORTANCE OF PARENTAL VARIABLES FOR PREDICTION OF OTHER PSYCHOLOGICAL VARIABLES (CONT'D)

(p values are given for R)

Affective Attributes	Sample	R	First	Second	Third	Fourth	Fifth
Attitude to Home	Total	0.01	X_{10}	X_{11}	X_1	X_7	X_5
	Boy	0.01	X_5	X_{11}	X_1	X_7	X_{10}
	Girl	0.01	X_{11}	X_1	X_{10}	X_7	X_9
Attitude (Comp.)	Total	0.01	X_5	X_{11}	X_7	X_{10}	X_9
	Boy	0.01	X_5	X_{11}	X_7	X_{10}	X_9
	Girl	0.01	X_7	X_5	X_{11}	X_1	$-X_6$
'Affiliation Attitude'	Total	0.01	X_{10}	X_7	X_1	X_{11}	X_5
	Boy	0.01	X_{10}	X_7	X_{11}	X_5	X_3
	Girl	0.01	X_{10}	X_{11}	X_1	X_5	X_7
'Frustration Attitude'	Total	0.01	X_1	X_{11}	X_{10}	X_2	X_3
	Boy	0.01	X_{10}	X_3	X_1	X_{11}	X_6
	Girl	0.01	X_1	X_{11}	X_2	X_{10}	X_4
Social Interest	Total	0.01	X_5	X_7	X_{10}	$-X_2$	X_{12}
	Boy	0.01	X_5	X_7	X_9	X_{12}	$-X_8$
	Girl	0.01	X_5	$-X_2$	X_{11}	$-X_4$	X_{10}
'Affiliation Interest'	Total	0.01	X_5	$-X_6$	$-X_{12}$	X_3	X_{10}
	Boy	0.01	X_5	$-X_6$	$-X_{12}$	X_7	X_4
	Girl	0.05	X_{10}	$-X_{11}$	X_3	$-X_8$	X_5
'Individuality Interest'	Total	0.01	X_9	$-X_8$	X_{12}	X_6	X_5
	Boy	-	X_9	X_7	X_5	$-X_8$	X_{12}
	Girl	0.01	X_6	$-X_8$	X_{12}	$-X_7$	X_{10}

The previous Table 87 shows very clearly that all parental favourable behaviours, namely concerned, democratic, and rational are important for general attitudes, 'affiliation', and 'frustration'. This seems to agree very well with common human experience as well as research findings from a number of sources which clearly suggest that favourable parental behaviours or child-rearing practices breed favourable attitudes. The overall picture of all the models is that X_{11} ('mother rational'), X_{10} ('father rational'), X_7 ('mother democratic'), X_1 ('father concerned'), and X_5 ('father democratic') are the chief determinants of attitude, in that order of importance.

The general picture of the interest models reveals that the order of importance of the parental factors is X_5 ('father democratic'), X_7 ('mother democratic'), and X_{10} ('father rational'). Such results correspond closely with those found in the discussion of the correlations of interest variables with parental variables, but the order of their importance is determined here.

Table 88: SIGNIFICANCE OF MULTIPLE R AND ORDER OF IMPORTANCE OF PARENTAL VARIABLES FOR PREDICTION OF OTHER PSYCHOLOGICAL VARIABLES (CONT'D)

(p values are given for R)

Affective Attributes	Sample	R	First	Second	Third	Fourth	Fifth
Academic Motivation	Total	0.01	X_7	X_1	X_{11}	X_5	$-X_6$
	Boy	0.01	X_5	X_{11}	X_9	$-X_6$	X_3
	Girl	0.01	X_7	X_1	$-X_9$	X_{11}	X_8
'School Work'	Total	0.01	X_1	X_{11}	$-X_{12}$	X_9	X_4
	Boy	0.05	X_1	$-X_{12}$	X_{11}	$-X_6$	X_9
	Girl	0.01	X_1	X_4	X_{11}	X_2	$-X_{12}$
'Intrinsic Motives'	Total	0.01	X_1	X_3	$-X_6$	$-X_{12}$	X_4
	Boy	0.01	$-X_3$	X_{12}	$-X_1$	$-X_6$	X_{11}
	Girl	0.01	X_1	X_7	X_4	$-X_6$	$-X_5$
'Incentive'	Total	0.01	X_1	X_{11}	X_4	$-X_{12}$	X_{10}
	Boy	0.01	X_1	X_{11}	X_4	$-X_{12}$	X_6
	Girl	0.01	X_1	X_{11}	X_4	X_{10}	$-X_{12}$
Popularity	Total	0.01	X_4	X_9	X_1	$-X_5$	X_{11}
	Boy	0.05	X_4	X_9	X_1	$-X_5$	X_8
	Girl	0.01	X_4	X_1	X_9	X_{12}	$-X_5$
Unpopularity	Total	-	$-X_9$	X_2	$-X_{11}$	X_3	X_5
	Boy	-	X_4	$-X_{10}$	X_5	$-X_1$	X_3
	Girl	-	$-X_9$	X_2	$-X_{11}$	X_1	X_6
Overall Popularity	Total	0.01	X_9	X_{11}	X_8	$-X_5$	X_1
	Boy	-	X_9	X_1	$-X_5$	X_8	$-X_{12}$
	Girl	0.05	X_9	X_{11}	$-X_5$	X_{12}	$-X_6$

The general picture of the motivation models reveals rather clearly that X_1 ('father concerned') and X_{11} ('mother rational') are the two main factors which contribute most to the variance of motivation variables. It seems to suggest that father concerned treatment and mother rational discipline are conducive to motivation in general. Surprisingly, parental teaching factors do not appear to be more influential.

Regarding popularity, the overall picture of all the models suggests that there are weaker relations to parental characteristics in boys than in girls, and also that X_4 ('mother restricted'), X_9 ('father autocratic'), and X_1 ('father concerned') are the important factors influencing popularity. In other words, lack of father autocracy and mother restrictiveness but presence of father concern would tend to produce popular children. This is confirmed by some of the research findings, such as Dinkmeyer's[5] (1965), that children from autocratic homes are more frequently rated as unpopular with classmates.

Table 89: SIGNIFICANCE OF MULTIPLE R AND ORDER OF IMPORTANCE OF PARENTAL VARIABLES FOR PREDICTION OF ACHIEVEMENTS

(p values are given for R)

Achievements	Sample	R	First	Second	Third	Fourth	Fifth
English	Boy	0.01	X_4	X_1	$-X_7$	$-X_5$	X_{11}
	Girl	-	X_9	X_5	$-X_3$	$-X_6$	X_2
Science	Boy	0.01	X_4	$-X_{11}$	X_1	$-X_7$	$-X_9$
	Girl	0.05	$-X_3$	X_{10}	$-X_{11}$	$-X_6$	X_9
Mathematics	Boy	0.01	X_4	$-X_7$	X_1	$-X_2$	$-X_3$
	Girl	0.05	$-X_3$	X_{10}	$-X_5$	$-X_{11}$	$-X_6$
Overall Achievement	Boy	0.01	X_4	$-X_7$	X_1	$-X_3$	$-X_9$
	Girl	0.05	X_9	$-X_3$	X_4	X_{10}	$-X_{11}$

The influence of the parental variables on the achievements of boys and girls is quite different. For boys, the important factors are X_4 ('mother restricted'), X_1 ('father concerned'), and X_7 ('mother democratic'), but for girls, X_3 ('mother concerned'), X_9 ('father autocratic'), and X_{10} ('father rational') are more important. This great difference can be explained in terms of the particular social situation found in Hong Kong. Mothers here are more concerned with the academic success of their sons. Furthermore, since in Hong Kong most mothers do not usually work outside home, while fathers go out most of the time and have less personal contact with the children at home, the mothers' influence is consequently much greater than the fathers'. As for girls, though mothers still have a dominating influence, fathers appear to exert a greater influence than they do on boys. It is also interesting to note that for predicting academic success, parental discipline factors appear not to be actively involved in the case of boys, whereas for girls, parental teaching factors are not of great importance.

To sum up, for the Hong Kong situation, it appears that, taking only the parental predictors into consideration, lack of mother restricted treatment and democratic teaching, and the presence of father concerned treatment tend to be beneficial in terms of academic achievement for boys; while lack of mother concerned treatment and father autocratic discipline, and the presence of father rational discipline appear to be more important for girls. It should be particularly pointed out that mother democratic teaching tends to be unfavourable for boys and mother concerned treatment unfavourable for girls. Perhaps again this has an important local bearing, since the present Hong Kong educational system does not particularly call for such democratic teaching for academic success. Also, concerned mothers might unduly affect the motivation of the girls, and hence lack of mother concerned treatment could well tend to be indirectly more helpful.

Table 90: SIGNIFICANCE OF MULTIPLE R AND ORDER OF IMPORTANCE OF ALL PSYCHOLOGICAL VARIABLES FOR PREDICTION OF ACHIEVEMENTS

(p values are given for R)

Achievements	Sample	R	First	Second	Third	Fourth	Fifth
English	Boy	0.01	X_{26}	X_5	X_{34}	X_{35}	$-X_8$
	Girl	0.01	X_{24}	X_{10}	X_6	X_{34}	$-X_8$
Science	Boy	0.01	X_{24}	X_{23}	$-X_{12}$	X_5	X_{25}
	Girl	0.01	$-X_1$	X_{27}	X_{16}	$-X_{12}$	X_{34}
Mathematics	Boy	0.01	X_{26}	X_{21}	$-X_{12}$	X_5	$-X_{15}$
	Girl	0.01	$-X_1$	X_{27}	X_{16}	$-X_4$	X_{34}
Overall Achievement	Boy	0.01	X_{26}	X_{23}	$-X_{12}$	X_5	$-X_{19}$
	Girl	0.01	$-X_1$	X_{34}	$-X_{15}$	X_{19}	X_{16}

Note: X_1 = age, X_4 = 'mother concerned', X_5 = 'mother restricted', X_6 = 'father democratic', X_8 = 'mother democratic', X_{10} = 'father autocratic', X_{12} = 'mother rational', X_{15} = social interest, X_{16} = academic motivation, X_{19} = affiliation interest, X_{21} = 'school work', X_{23} ='incentive', X_{24} = verbal, X_{25} = numerical, X_{26} = verbal+numerical, X_{27} = non-verbal, X_{34} = popularity, X_{35} = unpopularity.

When all the variables, i.e., parental, cognitive and affective variables of the students, are submitted to the stepwise regression analysis, other variables become more important than parental variables as predictors. Again the models for boys are quite different from those for girls. For boys, the important predictors are X_{26} (verbal+numerical) in English, mathematics, and overall achievement; X_{24} (verbal) in science; and X_{23} ('incentive') in science and overall achievement. Such results are expected and are in accordance with other research findings that verbal and numerical abilities are important for academic success, and also with the evidence

in this study that non-verbal ability is not emphasised in Hong Kong. Also, incentive plays also an important role in determining the success of boys. The two next important(parental)predictors for academic achievements are X_5 ('mother restricted') and X_{12} ('mother rational'). Absence of mother restricted treatment and lack of mother rational discipline appear more favourable. Again, such findings have rather more local importance, since with the present highly competitive Hong Kong educational system and the mainly factual content of the syllabuses, these apparently unrelated maternal characteristics are the most predictive of achievement in boys.

As regards achievement for girls, parental influence seems to be even less than for boys and does not come out prominently in the regression equations. The important predictors appear to be X_{24} (verbal) in English, and X_1 (age) in science, mathematics, and overall achievement. The negative bearing of age in the case of the girls is noteworthy, and a reasonable explanation for this is that dull girls stay on as repeaters and hence a negative relation appears. It also seems to show that this is not the case with boys since X_1 (age) does not appear in any equation as a negative or as a positive predictor. Other predictors which appear to be more important for girls are X_{34} (popularity), and X_{16} (academic motivation). This result is understandable if we consider that the more successful girls tend to be more popular with the class (e.g., the students usually elect their top girl to be their class monitress) and also that girls who continue with their studies till the age around 17 are generally better motivated than the average boys (the girls having more inducement to leave, and the boys being more concerned with their careers). Hence popularity and general academic motivation tend to be better predictors for success in girls.

It is of interest to note specially that for boys, on this evidence, incentive appears to be more important for academic success (alongside cognitive abilities), whereas for girls, popularity seems to have the

greater influence. We should have expected this, for such findings comply with common beliefs that Chinese boys are more concerned with academic honours and successes, while sentimental attitudes (especially popularity) are more common amongst girls and popular girls are usually idols for their classmates in social and academic matters.

4. Parental Differences in Various Behaviour

Table 91: SIGNIFICANCE OF PARENTAL DIFFERENCES IN "TREATED"

(p values are given)

"Treated" Items	ANOVA
1. warm - cold	0.01 *
2. stern - mild	0.05 *
3. relaxed - tense	-
4. hard - soft	0.01 *
5. ridicule - praise	0.01 *
6. lenient - severe	-
7. skilfully - awkwardly	0.01 *
8. insensitive - sensitive	0.05 *
9. justly - unjustly	0.05
10. punishment - reason	0.01
11. consistent - inconsistent	-
12. encouraged - discouraged	0.05
13. concerned - indifferent	0.01 *
14. critical - praised	0.01 *
15. close - distant	0.01 *
Multivariate	0.01 *

Note: 1. The high-scoring poles are underlined.

2. * indicates mother superior.

Table 92: SIGNIFICANCE OF PARENTAL DIFFERENCES IN "TAUGHT"

(p values are given)

"Taught" Items	ANOVA
1. often discussed - rarely discussed	0.01 *
2. disagreeing discouraged - disagreeing encouraged	-
3. supported - criticized	0.01 *
4. skilful - awkward	0.01
5. stern - mild	0.01 *
6. often together - rarely together	0.01 *
7. easy to irritate - hard to irritate	0.01
8. tense - relaxed	-
9. soft - hard	0.01 *
10. always right - admit mistakes	-
11. understood - did not understand	0.01 *
12. impatient - patient	0.05 *
13. criticized - praised	-
14. played on my own - displeased	-
Multivariate	0.01 *

Note: 1. The high-scoring poles are underlined.

2. * indicates mother superior.

Table 93: SIGNIFICANCE OF PARENTAL DIFFERENCES IN "DISCIPLINED"

(p values are given)

"Disciplined" Items	ANOVA
1. often punished - rarely punished	-
2. hard - soft	0.01 *
3. always explained - rarely explained	0.05
4. persuaded - ordered	0.01 *
5. angry - calm	-
6. lenient - severe	0.01 *
7. easy to irritate - hard to irritate	0.01
8. feel guilty - feel resentment	-
9. as parent wished - know the rules	-
10. mild - stern	0.01 *
11. reasonable - unreasonable	-
12. strict - permissive	0.01 *
13. resisted - yielded	-
14. run away - with family	0.01 *
15. blamed self - blamed parent	-
Multivariate	0.01 *

Note: 1. The high-scoring poles are underlined.

2. * indicates mother superior.

The previous three Tables 91-93 show that Hypothesis III, namely that "there are significant differences between paternal and maternal behaviours towards their children" may be accepted in the main, since most of the parental differences are found significant.

Bringing together the main points in the Tables, it would appear that mothers are generally viewed as superior to fathers in treatment, teaching and discipline. This finding bears out the generally recognised cultural parental characteristics of the Chinese community in Hong Kong. It is also in line with research in other countries, e.g., Sears et al.[6] (1957), in showing that mothers are more effective than fathers. This might have the particularly important implication that, in view of the more vital role played by the mothers in bringing up their children, the girls, who are future mothers, should be better educated and education for them should be equal to, if not better than, that of boys. Another point to note is that the above results provide additional validity to the Ginsburg Parent

Image Differential Test in eliciting children's concepts of parental behaviours.

5. School Differences in Various Variables

Table 94: SIGNIFICANCE OF BETWEEN-SCHOOL DIFFERENCES IN PSYCHOLOGICAL VARIABLES (p values are given)

Psychological Variables	ANOVA
1. Verbal	0.01
2. Numerical	0.01
3. Verbal+Numerical	0.01
4. Non-Verbal	0.01
5. General Intelligence	0.01
6. Attitude to Home	0.01
7. Attitude (Composition)	0.05
8. Affiliation Attitude	0.01
9. Frustration Attitude	0.01
10. Social Interest	0.01
11. Affiliation Interest	0.01
12. Individuality Interest	0.01
13. Academic Motivation	0.01
14. School Work	0.01
15. Intrinsic Motives	0.01
16. Incentive	0.01

The results here show clear evidence that there are highly significant differences among the fourteen schools in the various intellectual abilities and affective attributes of their students. This is to be expected in view of the way the sample was chosen (Chapter Six), i.e., different school types and locality were included. The above Table 94 shows clearly that Hypothesis IV which states that "there are significant between-school differences for the various cognitive and affective attributes of students" is completely confirmed.

An examination of Tables 27-28 (pp. 136 and 138) and Table 76 (p. 223) shows that there is a close correspondence of school results and the

intellectual abilities of the students and that government and aided schools have brighter students and hence better academic results. It is of interest to note that the non-verbal ability of the students in the technical school is found to be highest of all. It is also of interest to find that the only rural school in our sample has students with the highest degree of general academic motivation as well as 'intrinsic motives' and 'incentive'. Hence the rural children who do stay in school till the age of 17 or above are a more select group. It should also be pointed out that the technical students in this study are less motivated in their 'school work', and this is hardly surprising as in Hong Kong technical education is not held in as high esteem as academic "grammar school type" courses. Hence students in technical schools are quite likely to be less motivated towards academic success than their counterparts in the grammar schools. Another point to note is that the students in the academically worst school of our sample are the lowest in their 'intrinsic motives'. This is self-explanatory. Finally, the differences among schools were found greatest in students' intellectual abilities, and intrinsic motives; and these are largely the qualities required for academic success as shown in our regression models for achievements in boys and girls.

6. Other Results

Three other important results of this investigation are also tabulated below. Though they are not directly used for testing our main hypotheses, they are considered valuable in that they throw more light on parent-child interaction in Hong Kong as well as in other places.

(a) Sex Differences in Parental Variables

Table 95: SIGNIFICANCE OF SEX DIFFERENCES IN RATINGS OF PARENTAL VARIABLES

(p values are given)

Parental Variable	ANOVA
1. Father Concerned	-
2. Father Restricted	0.01 *
3. Mother Concerned	-
4. Mother Restricted	-
5. Father Democratic	-
6. Father Demanding	0.01 *
7. Mother Democratic	-
8. Mother Demanding	-
9. Father Autocratic	0.01 *
10. Father Rational	-
11. Mother Rational	-
12. Mother Autocratic	0.01 *

Note: * indicates that girls give higher ratings.

The findings that boys give significantly lower ratings than girls on the parental unfavourable traits ('father restricted', 'father demanding', 'father autocratic', and 'mother autocratic') show that the father applies more restricted treatment, more demanding teaching, and that both parents use more autocratic discipline for boys than for girls. This is in accordance with the boy-centred Chinese practice to be found in Hong Kong, which over a long period has emphasised the education of boys. The boys are expected to support the family in the future and hence their upbringing is more severe. Girls were originally considered of "less value". It could therefore be said that this gives a rather strong evidence to the general belief in Hong Kong that parents tend to pay more attention to the boys who are to be potential heads of the family.

(b) Sex Differences in Importance of Parental Factors

Table 96: PERCENTAGE OF TOTAL VARIANCE EXPLAINED BY PARENTAL FACTORS IN SIX CORRESPONDING FACTOR ANALYSES

(Hong Kong Boys and Girls)

Concept	Factors	Boys	Girls
1. Father Treated	Concerned	15	29 *
	Restricted	9	13 *
2. Mother Treated	Concerned	31 *	11
	Restricted	14	29 *
3. Father Taught	Democratic	29	33 *
	Demanding	15	15
4. Mother Taught	Democratic	23 *	13
	Demanding	15	34 *
5. Father Disciplined	Autocratic	36 *	17
	Rational	16	32 *
6. Mother Disciplined	Rational	32 *	12
	Autocratic	15	36 *

Note: * indicates greater percentage of total variance.

Though similar factors for boys and girls appear for each of the six parental concepts, they are varied in their importance. It appears that there are more parental factors with high variance for girls than for boys, showing that parental behaviour is more uniform for boys than for girls. Also, among the superior factors (i.e., with greater percentage of variance), there are more important maternal than paternal factors for boys (three out of four factors), and the reverse appears to be the case for girls (four out of seven factors). This seems to imply that in general mother behaviour is more varied for boys while father behaviour is more so for girls. Hence mothers tend to be more influential for boys and fathers more influential for girls, and this in turn is in agreement with the other findings of this study.

(c) Cross-Cultural Comparison of Importance of Parental Factors

Table 97: PERCENTAGE OF TOTAL VARIANCE EXPLAINED BY PARENTAL FACTORS IN SIX CORRESPONDING FACTOR ANALYSES (CONT'D)

(Hong Kong, Singapore, North America, and Mexico)

Concept	Factors	Hong Kong	Singapore	North America	Mexico
1. Father Treated	Concerned	31	30	5	30
	Restricted	13	16	9	15
2. Mother Treated	Concerned	29	35	4	5
	Restricted	12	6	13	5
3. Father Taught	Democratic	31	26	9	13
	Demanding	15	15	6	6
4. Mother Taught	Democratic	28	26	10	20
	Demanding	13	15	4	6
5. Father Disciplined	Autocratic	35	22	35	23
	Rational	16	19	5	10
6. Mother Disciplined	Rational	33	14	13	15
	Autocratic	13	28	35	10

Note: Hong Kong and Singapore data are from the present investigator's own factor analyses; North American and Mexican data are supplied by Ginsburg et al.

In general, the particular parental factors investigated in this study appear to be more important in Hong Kong than in Singapore, North America, and Mexico. It is not surprising to note that the similarity of importance of the factors is greater between Hong Kong and Singapore than in the case of the other two countries. Obviously Hong Kong and Singapore have a lot in common. Both places have Chinese as the majority of the population and have had a dominating British influence in the past. Their background history is similar, and they are also similar geographically (being both coastal islands), educationally (a predominantly British system), and socio-economically (similar background and current problems). In fact, it can be

said they are culturally similar, and this best accounts for the remarkable similarity in their parental patterns. On the other hand, the North American and Mexican factors are more similar in variances. Again, this can be explained by the fact that the North American and Mexican cultures have had a related history and are thus comparatively more similar to each other than to Hong Kong or Singapore.

The discussion of results in this chapter shows that this study has clearly identified the significant relation of parent-child interaction and certain psychological attributes of adolescents in Hong Kong and that the various hypotheses formulated in Chapter Three are partially or completely confirmed. Also, some cross-cultural data were incorporated in order to compare parent-child interaction in two groups of contrasting countries: the East (Hong Kong and Singapore) and the West (U.S.A. and Mexico).

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CHAPTER TEN

SUMMARY AND CONCLUSIONS

1. Summary of Findings

Bringing together the various trends already set down in order to assess the significance of our conclusions, and in the knowledge that all the findings of this study must be regarded as tentative and locally circumscribed, it may first be stated that it was found possible to identify by the use of Ginsburg Parent Image Differential Test, twelve major parental variables for investigating parent-child interaction. They are: (1) Treatment area --- 'father concerned', 'father restricted', 'mother concerned', 'mother restricted'; (2) Teaching area --- 'father democratic', 'father demanding', 'mother democratic', 'mother demanding'; and (3) Discipline area --- 'father autocratic', 'father rational', 'mother rational', 'mother autocratic'. The corresponding father and mother factors were found to be of comparable importance except that for father, 'autocratic' is more important than 'rational' and the reverse is true for mother.

The psychological attributes investigated in this study were intellectual abilities, attitude to home, social interest, academic motivation and popularity. For intelligence, the AH4 Test was used. New psychological measures were constructed by the investigator for the other attributes. The subjects were Hong Kong adolescent students around the age of 17 in Form IV classes of a representative sample of Anglo-Chinese schools where English was the main medium of instruction. A study of parent-child interaction and the above psychological attributes was made. However, in view of the great emphasis on school achievement (i.e., examination results) by students and parents as well as by society at large, it is of much interest to see the relations of parent-child interaction by itself, and together with the psychological attributes, to achievement in the main academic subjects: English, science, and mathematics as well as overall school

achievement. Finally, considering the particular cultural context in Hong Kong, cross-cultural evidence is also examined in some detail to support the argument that the Hong Kong situation is rather unique. Hence any interpretation of the results must be done in the light of the cultural, social, economic, and educational pattern of Hong Kong.

The main conclusions of the present study are summarised as follows: Certain important factors for better intellectual development of children were identified as 'father concerned', 'father restricted', 'mother restricted', and 'mother autocratic', i.e., more concerned and less restrictive fathers, less restrictive but more autocratic mothers are found to be more effective. Also, parental 'democratic' teaching appears unfavourable to numerical and verbal+numerical abilities. It is of interest to note that on the whole, parental treatment rather than teaching is more influential in children's intellectual development.

There are evidently some highly significant relationships between students' attitude to home and all parental factors both favourable and unfavourable; but only the favourable parental factors, i.e., 'concerned', 'democratic', and 'rational' are found to have highly significant relationships with students' social interest and academic motivation. Regarding students' popularity, significant relationships exist primarily in the parental treatment area. There are not many significant relationships between students' achievement and parental factors, but for the boys in this study, 'father concerned' and 'mother restricted', and for girls, 'father autocratic' appear to be the important factors.

Boys are found on the present evidence to be better than girls in their numerical, verbal+numerical, non-verbal, and general intelligence though not significantly so in verbal ability. Father apparently plays a more important part than mother in reducing sex differences in all intellectual abilities, whereas mother appears more responsible than father

in contributing sex differences in the various intellectual abilities except verbal.

Girls are significantly more favourable than boys in their attitude to home, academic motivation, and popularity. Parental factors are found to associate to various degrees with the above differences. However, boys are found to be significantly better than girls in the numerical subject of mathematics. And though in general, parental factors are associated with this difference, age and intellectual abilities are shown to be of much greater importance.

When predictions of the various psychological attributes from the parental factors are considered, we find that the important predictors for intellectual abilities are 'mother restricted', 'mother autocratic', 'father concerned', and 'father democratic'. For the boys, the paternal predictors appear to be more important than the maternal ones in predicting non-verbal and general intelligence. Predictions of students' attitude to home tend to be more accurate, since the multiple correlation coefficients here are much higher. The important predictors for attitude have been identified as 'mother rational', 'father rational', 'mother democratic', 'father concerned', and 'father democratic'; whereas for social interest, the predictors are 'father democratic', 'mother democratic', and 'father rational'. For predicting students' academic motivation, 'father concerned' and 'mother rational' are in general found to be more important, whereas for popularity, the more important predictors are 'mother restricted', 'father autocratic', and 'father concerned'.

When predictions of school achievement from the parental factors are made, the following interesting situation is found. For boys, the important predictors are 'mother restricted', 'father concerned', and 'mother democratic', but for girls, they are 'mother concerned', 'father autocratic', and 'father rational'. However, when predictions are made from an aggregate

of all the variables, i.e., parental as well as other variables, intellectual predictors (verbal+numerical and verbal) and 'incentive' are shown to be more important though 'mother restricted' and 'mother rational' still have some influence for boys. For girls, verbal ability, age, popularity, and academic motivation appear to be the important predictors, but parental factors do not seem to have much predictive importance.

The overall results also show that mothers are rated significantly higher than fathers in the various dimensions of treatment, teaching, and discipline. There is also clear evidence that there are significant differences in these students' intellectual abilities and affective attributes as distributed among the different schools in this study. Another interesting finding is that fathers in the home situation show more restricted treatment, and more demanding teaching, and that both parents show more autocratic discipline for boys than for girls.

Other findings of this investigation include the evidence that maternal factors tend to be more influential for boys while paternal factors are more so for girls. It should be also pointed out that the parental factors investigated in this study are in general found to be more important for Hong Kong than for Singapore, North America, and Mexico. It is also hardly surprising to find that in view of the particular cultural backgrounds, these parental factors are more similar in importance between Hong Kong and Singapore, and again between North America and Mexico, than between Asian and American groups.

Based on the above generalisations, seven main trends may be identified for the Hong Kong situation:

(1) lack of mother restricted treatment is of most importance in intellectual advancement;

(2) father favourable behaviours and in particular father rational discipline are helpful in the formation of an affiliative attitude to home;

(3) father democratic teaching has the most favourable effect on social interest;

(4) father concerned treatment is most important for high academic motivation;

(5) lack of mother restricted treatment is more conducive to popularity;

(6) when only parental variables are considered, for boys, lack of mother restricted treatment is most important for academic achievement; while for girls, lack of mother concerned treatment is of overall importance. But, when both parental and other variables are considered together, in general, verbal+numerical ability is of overall importance for boys and age for girls, rather than parental variables for either case;

(7) boys are better than girls in intellectual abilities and academic achievement; girls are better than boys in attitude to home, academic motivation, and popularity; but there is no sex difference in social interest.

Five further but related conclusions can also be drawn from the data:

(1) Mothers are viewed as being more favourable in their treatment, teaching, and discipline as a whole.

(2) Students in different schools vary in their intellectual abilities, attitude to home, social interest, and academic motivation.

(3) Parents tend to behave more strictly towards boys than towards girls.

(4) Maternal factors are found to be more influential for boys.

(5) The parental factors in this study have greater importance in Hong Kong than in the other places referred to in this study.

Summing up the main trends found in the course of this research, then, it would appear that the mother has greater influence on children's intelligence, popularity and academic success, while the father seems to be more associated with children's attitude to home, social interest, and academic motivation. In other words, mothers tend to be more responsible for the students' cognitive aspects and fathers are perhaps more responsible for their affective aspects. Moreover, in general, more pressures are put

on the boys by the parents, especially by the mother. This is in agreement with the male-centred society and patriarchal home practices of the Chinese culture in Hong Kong. Also, in general, the boys are found to be superior in cognitive aspects, perhaps due to more attention, privileges, and educational opportunities. However, the girls are superior in affective aspects, perhaps due to their subordinate position at home. This also seems to be a manifestation of the traditional Chinese sayings: "Ignorance is a virtue in girls", and "The place for girls is home".

This study also demonstrates that the Ginsburg Parent Image Differential Test is a valid and reliable instrument and works very satisfactorily in yielding meaningful results (factor patterns) and hence this approach, i.e., using the child's perception for assessing parental behaviour, seems to be fruitful and opens up further possibilities for studying parent-child interaction. Moreover, it can also be said that the semantic differential appears to be a useful format for similar studies in other countries, since cross-cultural evidence in this study provides some support for the view that human beings, regardless of their cultures and language background, share a common framework for differentiating affective meanings of words or phrases. It can be concluded that the Ginsburg Parent Image Differential Test has proved to be a particularly useful instrument in a survey-type study like this, where direct observation and rating of parental behaviour would be extremely difficult and practically impossible.

2. <u>Hong Kong Situation and Suggestions for Further Research</u>

It should perhaps be emphasised that this is a pioneer study for Hong Kong. Though the various findings from this investigation fall rather neatly into a meaningful pattern and the interpretations seem plausible in terms of the particular Hong Kong social and cultural situation, the results may not in any case be considered final. Further research is clearly necessary in most aspects of this subject.

(a) The Limitation

Some tentative conclusions have been drawn but we should remain aware of an important limitation of this investigation. Since education in Hong Kong is neither compulsory nor free at the secondary level, and though free primary education was introduced recently, the Hong Kong samples used in this study are likely to be much more homogeneous than those used for similar studies in other countries. Somewhat more than half of the secondary school age group attend secondary schools; the rest stay at home for financial or other reasons. In the poor-income group, circumstances have forced some parents to send their children aged above 12 years old to work to help support the family. In the case of girls, they are more likely required to help look after their younger brothers and sisters while the parents go to work. Consequently, the present study did not and could not possibly include those children who are not at school. Also, this study did not cover those students in Chinese middle schools, where the teaching medium is Chinese. The point is that perhaps if in some way these out-of-school children and the Chinese middle school students could also have been involved in a similar investigation, the results might have been found to be even more revealing.

(b) Other Variables

A few further considerations apply: it is not always possible nor advisable to remove the effects of other variables which have not been investigated in this study but which in fact may be of great importance. These other variables include socio-economic family variables, school and teacher variables, peer variables, and possibly also the personality variables of the students, e.g., introvert versus extravert, etc. (Appendices22-23). If such variables could be held constant in some way, we could be more certain of our task of attributing the various cognitive and affective differences to parent-child interaction. In real life

situations, all such factors operate together and it is not easy nor feasible to study some in isolation from others. A truly ambitious scheme would be to investigate the whole range of environmental and human variables together. It may prove possible to identify the important factors which should be studied more fully in relation to the various cognitive aspects and affective status of our adolescents.

(c) Cultural Pressures

Clearly cultural variations are likely to be influential and may well be considered important determinants of how the children in a particular culture should be brought up, and what measures of child-rearing are acceptable and considered desirable. Cultural variation is important mainly because of its influence on the atmosphere of the parent-child interaction. For a traditional Chinese child, an autocratic parent is generally accepted and the child tends to be excessively submissive to authority. Such an interaction is largely governed by the organised social roles of the Chinese culture. However, the cultural values in Hong Kong are gradually changing, and the new generations tend more and more to accept Western values. Even more important for the present study is the cultural pressure of the ancient Chinese filial piety which has been considered the greatest of all virtues all wishes must be subordinated to those of the parents. Again, this attitude may be waning, but it still has a definite influence on our children. So Hong Kong has a rather unique culture of its own --- Chinese long-standing traditions mixed to various degrees with Western values. It would therefore be of great interest to investigate the expectations of present-day Hong Kong parents and to see how they bear on the results of this study.

(d) Examination Pressures

Though there are adolescent problems in Hong Kong, they are to a considerable degree different in nature to those encountered in Western

countries. In Western countries, the transition from childhood to adulthood is relatively abrupt and difficult because cultural pressures require the adolescent to learn rapidly to become independent; hence adolescence is often a period of stress, conflict, and emotional upset. On the other hand in Hong Kong, an adolescent generally receives a more gradual preparation for independence, and in fact parents in the main tend not to encourage independence too soon. Consequently, our adolescent problems are quite different.

It seems appropriate to reiterate the point that Hong Kong is a competitive capitalist society run on laissez-faire lines, and people are all the time trying to excel over others. This enhances educational opportunities and motives since in order to put oneself in a better position for economic security and survival, one tends to seek a better education at almost any cost. Academic success is thus of particular importance for the child's future in Hong Kong. Moreover, scholarship has headed the list of desired qualities for thousands of years in China. For these two reasons, children in Hong Kong have been under examination pressures since the age of 6, or even earlier in kindergarten. Examinations are very frequent and play a very significant role in the secondary school years; and these problems become more acute at the adolescent stage when children have to face important external examinations which decide their future. Parents usually take a special interest in their children's studies and stress competition and school achievement as a means of social advancement. No doubt in many cases, the parents succeed in pressing their children forward to acquire academic distinctions and consequently better prospects. However, these academic and life successes have often been achieved at the expense of other possibly more desirable abilities or potentials. Questions relevant to the findings of the present study apply, e.g., "Does such a situation have unfortunate psychological effects on our children?"

The Hong Kong examination system has long been criticised for being too rigidly demanding as to allow any opportunity for free intellectual development. The children are too much dominated by regular formal examinations in school and also public examinations. It seems that education here is little more than a series of examinations, especially at the later stages of the secondary level. The present curriculum in Hong Kong is also rather traditional and aims too much at factual knowledge. This encourages memorizing and rote learning and thus does not induce creative and critical thinking, enquiry, initiative, imagination, or aesthetic appreciation. Such an examination system and school curriculum not only fails to develop intellectual abilities to full capacity, but also tends to limit the future career prospects of our children. Moreover, it probably hinders personality development and affects (as in this study) attitude to home, social interest, academic motivation, and popularity. Since parents have concentrated on helping the children to cope with the existing examination requirements, there is little time left for attention to the proper development of children's desirable psychological traits.

The Chinese traditional examination system for selecting scholars seems still to have its place in the mind of most Chinese parents in Hong Kong. They tend to feel proud of their children who achieve distinctions in examinations, because they think this will add to or maintain the prestige of the family. Others tend to rely on the success of their children to move up the social ladder. Such examination and parental pressures on the children are likely to cause anxiety, stress, conflict, and often a sense of insecurity, especially at the adolescent stage; and these have been considered psychologically undesirable for the mental development of children.

With all the above considerations in mind, it would appear that for the Hong Kong situation, it is worth looking more closely at the effects

of this over-emphasis on examination and academic honours on the parent-child interaction and on the related psychological attributes of Hong Kong students. Also, a careful systematic study seeking to relate parental pressures to the personality types of children in Hong Kong may be considered fruitful. Apart from being an important area for research, it is felt that such findings would provide a better answer to some of the problems raised in the present study of parent-child interaction. This would be of particular value to Hong Kong at this stage when the government is looking at the examination system more closely and developing a new curriculum to facilitate the intellectual and personality development of children.

(e) Summing Up

When some of the above further research is completed, an even clearer picture of the relation of parent-child interaction and the psychological attributes of adolescents in Hong Kong will no doubt be presented. It is hoped that through the accumulation of more evidence along these lines, the cross-currents and main features of the various family, school, and society environments which are significant for the developing child will be more clearly identified, this leading to a better understanding of our adolescents as a whole.

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TABLE OF APPENDICES

Appendix 1. Parent Image Differential Test

QUESTIONNAIRE

INSTRUCTIONS

At the top of each of the following pages is a phrase in capital letters. Beneath the phrase are a number of items on which you describe the phrase. Here is an example:

HOW MY DENTIST TREATED ME THE LAST TIME I SAW HIM

hard ____: ____: ____: ____: ____: ____: ____ soft

If you feel that the dentist treated you in an EXTREMELY "hard" fashion, make an "X" as follows:

hard __X__: ____: ____: ____: ____: ____: ____ soft

If he treated you in an EXTREMELY "soft" fashion:

hard ____: ____: ____: ____: ____: ____: __X__ soft

If he treated you in a QUITE "pleasant" fashion:

pleasant ____: __X__: ____: ____: ____: ____: ____ unpleasant

Or in a QUITE "unpleasant" fashion:

pleasant ____: ____: ____: ____: ____: __X__: ____ unpleasant

If he treated you in a SLIGHTLY "safe" way:

safe ____: ____: __X__: ____: ____: ____: ____ dangerous

Or in a SLIGHTLY "dangerous" way:

safe ____: ____: ____: ____: __X__: ____: ____ dangerous

If you feel that a particular item is NOT RELATED to the phrase at the top of the page, or if you feel that both sides of the item apply equally to the phrase, then you should check the centre space on that item. For example, if you feel that the dentist treated you in a way that was equally "good" and "bad" then:

good ____: ____: ____: __X__: ____: ____: ____ bad

IMPORTANT: 1) Always place your "X" in the middle of the space.
2) Check EVERY ITEM - DO NOT SKIP ANY
3) Never put more than one "X" on an item.

Work Fast -do not spend much time thinking about any single item. It is your first impressions, your immediate "feelings" that are important. DO NOT LOOK BACK AND FORTH through the items. DO EACH ITEM IN ORDER - none of them is repeated, although many of them will come to look familiar to you.

Name: _____ Sex: ____ Date of birth: _____

HOW MY FATHER TREATED ME WHEN I WAS A CHILD

1. warm ____: ___: ___: ____: ____: ___: ____ cold

2. stern ____: ____: ___: ____: ____: ____: ____ mild

3. relaxed ____: ____: ____: ____: ____: ____: ____ tense

4. hard ____: ___: ____: ____: ____: ____: ____ soft

5. with ridicule ____: ____: ____: ____: ____: ____: ____ with praise

6. lenient ____: ____: ____: ____: ____: ____: ____ severe

7. skilfully ____: ____: ____: ____: ____: ____: ____ awkwardly

8. insensitive ____: ____: ____: ____: ____: ____: ____ sensitive

9. justly ____: ____: ___: ____: ____: ____: ____ unjustly

10. with punishment ____: ____: ____: ____: ___: ____: ____ with reason

11. consistent ____: ____: ____: ____: ___: ____: ____ inconsistent

12. encouraged me ____: ____: ____: ____: ____: ____: ____ discouraged me

13. concerned ____: ____: ____: ____: ____: ___: _____ indifferent

14. usually critical ___: ____: ___: ____: ____: ____: ____ usually praised

15. close ____: ____: ____: ____: ____: ____: ____ distant

HOW MY MOTHER TREATED ME WHEN I WAS A CHILD

1. warm ____: ____: ____: ____: ____: ____: ____ cold

2. stern ____: ____: ____: ____: ____: ____: ____ mild

3. relaxed ____: ____: ____: ____: ____: ____: ____ tense

4. hard ____: ____: ____: ____: ____: ____: ____ soft

5. with ridicule ____: ____: ____: ____: ____: ____: ____ with praise

6. lenient ____: ____: ____: ____: ____: ____: ____ severe

7. skilfully ____: ____: ____: ____: ____: ____: ____ awkwardly

8. insensitive ____: ____: ____: ____: ____: ____: ____ sensitive

9. justly ____: ____: ____: ____: ____: ____: ____ unjustly

10. with punishment ____: ____: ____: ____: ____: ____: ____ with reason

11. consistent ____: ____: ____: ____: ____: ____: ____ inconsistent

12. encouraged me ____: ____: ____: ____: ____: ____: ____ discouraged me

13. concerned ____: ____: ____: ____: ____: ____: ____ indifferent

14. usually critical ____: ____: ____: ____: ____: ____: ____ usually praised

15. close ____: ____: ____: ____: ____: ____: ____ distant

HOW MY FATHER TAUGHT ME WHEN I WAS A CHILD

1. often discussed things with me ____: ____: ____: ____: ____: ____: ____ rarely discussed

2. disagreeing was discouraged ____: ____: ____: ____: ____: ____: ____ disagreeing encouraged

3. supported my mistakes ____: ____: ____: ____: ____: ____: ____ criticized

4. skilful in teaching me new things ____: ____: ____: ____: ____: ____: ____ awkward

5. stern ____: ____: ____: ____: ____: ____: ____ mild

6. often did things together with me ____: ____: ____: ____: ____: ____: ____ rarely did things together

7. easy to irritate ____: ____: ____: ____: ____: ____: ____ hard to irritate

8. in a tense way ____: ____: ____: ____: ____: ____: ____ relaxed

9. soft ____: ____: ____: ____: ____: ____: ____ hard

10. acted as if always right ____: ____: ____: ____: ____: ____: ____ willing to admit mistakes

11. basically understood me ____: ____: ____: ____: ____: ____: ____ basically did not understand

12. impatient ____: ____: ____: ____: ____: ____: ____ patient

13. usually criticized my conduct ____: ____: ____: ____: ____: ____: ____ usually praised

14. pleased when I acted on my own ____: ____: ____: ____: ____: ____: ____ displeased

HOW MY MOTHER TAUGHT ME WHEN I WAS A CHILD

1. often discussed things with me ____: ____: ____: ____: ____: ____: ____ rarely discussed

2. disagreeing was discouraged ____: ____: ____: ____: ____: ____: ____ disagreeing encouraged

3. supported my mistakes ____: ____: ___: ____: ____: ____: ____ criticized

4. skilful in teaching me new things ____: ___ : ____: ____: ____: ____: ____ awkward

5. stern ____: ____: ____: ____: ____: ____: ____ mild

6. often did things together with me ____: ____: ____: ___: ____: ____: ____ rarely did things together

7. easy to irritate ____: ____: ____: ____: ____: ____: ____ hard to irritate

8. in a tense way ____: ____: ____: ____: ____: ____: ____ relaxed

9. soft ____: ____: ____: ____: ____: ____: ____ hard

10. acted as if always right ____: ____: ____: ____: ____: ____: ____ willing to admit mistakes

11. basically understood me ____: ____: ____: ___: ____: ____: ____ basically did not understand

12. impatient ____: ____: ____: ____: ____: ____: ____ patient

13. usually criticized my conduct ____: ____: ____: ____: ____: ____: ____ usually praised

14. pleased when I acted on my own ____: ____: ____: ____: ____: ____: ____ displeased

HOW MY FATHER DISCIPLINED ME WHEN I WAS A CHILD

1. often punished me ____: ____: ____: ____: ____: ____: ____ rarely punished

2. hard ____: ____: ____: ____: ____: ____: ____ soft

3. always explained why punished ____: ____: ____: ____: ____: ____: ____ rarely explained why punished

4. usually persuaded me ____: ____: ____: ____: ____: ____: ____ usually ordered

5. got angry when punishing ____: ____: ____: ____: ____: ____: ____ stayed calm

6. lenient ____: ____: ____: ____: ____: ____: ____ severe

7. easy to irritate ____: ____: ____: ____: ____: ____: ____ hard to irritate

8. made me feel guilty ____: ____: ____: ____: ____: ____: ____ made me feel resentment

9. expected me to do as he wished ____: ____: ____: ____: ____: ____: ____ expected me to know the rules

10. mild ____: ____: ____: ____: ____: ____: ____ stern

11. made reasonable demands ____: ____: ____: ____: ____: ____: ____ unreasonable

12. strict ____: ____: ____: ____: ____: ____: ____ permissive

13. I resisted him ____: ____: ____: ____: ____: ____: ____ I yielded

14. often wanted to run away ____: ____: ____: ____: ____: ____: ____ always wanted to be with family

15. blamed myself when punishing ____: ____: ____: ____: ____: ____: ____ blamed him

HOW MY MOTHER DISCIPLINED ME WHEN I WAS A CHILD

1. often punished me ____: ____: ____: ____: ____: ____: ____ rarely punished

2. hard ____: ____: ____: ____: ____: ____: ____ soft

3. always explained why punished ____: ____: ____: ____: ____: ____: ____ rarely explained why punished

4. usually persuaded me ____: ____: ____: ____: ____: ____: ____ usually ordered

5. got angry when punishing ____: ____: ____: ____: ____: ____: ____ stayed calm

6. lenient ____: ____: ____: ____: ____: ____: ____ severe

7. easy to irritate ____: ____: ____: ____: ____: ____: ____ hard to irritate

8. made me feel guilty ____: ____: ____: ____: ____: ____: ____ made me feel resentment

9. expected me to do as he wished ____: ____: ____: ____: ____: ____: ____ expected me to know the rules

10. mild ____: ____: ____: ____: ____: ____: ____ stern

11. made reasonable demands ____: ____: ____: ____: ____: ____: ____ unreasonable

12. strict ____: ____: ____: ____: ____: ____: ____ permissive

13. I resisted her ____: ____: ____: ____: ____: ____: ____ I yielded

14. often wanted to run away ____: ____: ____: ____: ____: ____: ____ always wanted to be with family

15. blamed myself when punishing ____: ____: ____: ____: ____: ____: ____ blamed her

AH4

Appendix 2. AH4 Test

PART I	
Score	Grade
PART II	
Score	Grade
TOTAL	
Score	Grade

ANSWER SHEET

(1968 REVISION)

No. *To-day's date* .....

Full name .....

Age *Sex* *Age when you left school* .....

Name of your present/last school .....

Present job .....

Last job .....

Job before last .....

Number and nature of any previous tests .....

.....

.....

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AH4 ANSWER SHEET

PART I TEST

EXAMPLES

Page 1

Question	Answer
1	9
2	
3	2
4	
5	16
6	
7	2
8	
9	4
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11	1
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Page 3

Question	Answer
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Page 4

Question	Answer
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Question	Answer
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Question	Answer
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Question	Answer
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PART II TEST

EXAMPLES

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Question	Answer
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5	1
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9	5
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Question	Answer
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Page 11

Question	Answer
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Page 12

Question	Answer
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Page 13

Question	Answer
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Question	Answer
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Question	Answer
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Question	Answer
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AH4

AH4
QUESTION BOOK
(1968 REVISION)

INSTRUCTIONS

Below are some examples of the test. Do them now.
Write your answers on the answer sheet. Write the number, not the word.
Some of the examples are already done for you.

DO NOT WRITE ANYTHING ON THIS PAPER

PART I. EXAMPLES

Q 1	1, 2, 3, 4, 5, 6, 7, 8, 9. Write down the largest of these figures.	Q 1
Q 2	1, 2, 3, 4, 5, 6, 7, 8, 9. Write down the middle one of these figures.	Q 2
Q 3	*Late* means the opposite of... 1 appointment, 2 early, 3 behind, 4 postponed, 5 immediate.	Q 3
Q 4	*Big* means the opposite of... 1 tall, 2 large, 3 place, 4 small, 5 high.	Q 4
Q 5	1, 4, 7, 10, 13... What number comes next?	Q 5
Q 6	2, 4, 8, 16, 32... What number comes next?	Q 6
Q 7	*Fish* is to *swim* as *bird* is to... 1 man, 2 fly, 3 walk, 4 aeroplane, 5 sparrow.	Q 7
Q 8	*Low* is to *high* as *bad* is to... 1 evil, 2 red, 3 try, 4 good, 5 right.	Q 8
Q 9	Here are three figures: 325. Add the largest two figures together and divide the total by the smallest figure.	Q 9
Q 10	Here are three figures: 594. Subtract the smallest figure from the biggest and multiply the result by the figure printed immediately before the biggest figure.	Q 10
Q 11	*Young* means the same as... 1 youthful, 2 ancient, 3 vigorous, 4 hot, 5 baby.	Q 11
Q 12	*Gift* means the same as... 1 parcel, 2 toy, 3 birthday, 4 buy, 5 present.	Q 12

If there is anything you do not understand, please ask the tester *now*.

DO NOT TURN OVER UNTIL YOU ARE TOLD TO DO SO.

046/835/570/15T

294.

DO NOT WRITE ANYTHING ON THIS PAPER

Q 1	1, 2, 3, 4, 5, 6, 7, 8, 9. Multiply the middle one of these figures by 2.	Q 1
Q 2	*Easy* means the opposite of... [1] problem, [2] simple, [3] difficult, [4] always, [5] cannot.	Q 2
Q 3	15, 35, 55, 75, 95... What number comes next?	Q 3
Q 4	*Seed* is to *plant* as *egg* is to... [1] tree, [2] bird, [3] pollen, [4] oats, [5] potato.	Q 4
Q 5	Here are three figures: 234. Divide the biggest figure by the smallest and add the result to the figure printed immediately after the smallest figure.	Q 5
Q 6	*Rich* means the same as... [1] poor, [2] wealthy, [3] high, [4] new, [5] lucky.	Q 6
Q 7	1, 2, 3, 4, 5, 6, 7, 8, 9. Write down the fourth figure to the left of 7.	Q 7
Q 8	*Right* means the opposite of... [1] action, [2] good, [3] careless, [4] wrong, [5] motive.	Q 8
Q 9	1, 2, 4, 8, 16... What number comes next?	Q 9
Q 10	*Foot* is to *leg* as *hand* is to... [1] body, [2] finger, [3] tall, [4] limb, [5] arm.	Q 10
Q 11	Here are three figures: 327. Subtract the smallest figure from the biggest and multiply the result by the figure printed immediately before the biggest figure.	Q 11
Q 12	*Old* means the same as... [1] decaying, [2] tired, [3] aged, [4] youth, [5] mended.	Q 12
Q 13	1, 2, 3, 4, 5, 6, 7, 8, 9. Add the first five figures together and subtract them from the sum of the last four.	Q 13
Q 14	*Lost* means the opposite of... [1] winning, [2] draw, [3] found, [4] alone, [5] mislaid.	Q 14
Q 15	3, 3, 7, 7, 11... What number comes next?	Q 15

GO ON TO THE NEXT PAGE

DO NOT WRITE ANYTHING ON THIS PAPER

Q 16	*Army* is to *navy* as *soldier* is to... 1 airman, 2 sea, 3 service, 4 sailor, 5 uniform.	Q 16
Q 17	Here are three figures: 132. Divide the biggest figure by the smallest and add the result to the figure printed immediately after the smallest figure.	Q 17
Q 18	*Portion* means the same as... 1 some, 2 whole, 3 part, 4 any, 5 cake.	Q 18
Q 19	If a castle is bigger than a cottage, write down the second of these figures: 1, 2, 3, 4, 5, 6, 7, 8, 9. If it is not, write down the sixth.	Q 19
Q 20	*Up* means the opposite of... 1 short, 2 small, 3 low, 4 down, 5 young.	Q 20
Q 21	$\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$... What number comes next?	Q 21
Q 22	*Seeing* is to *picture* as *hearing* is to... 1 sight, 2 sculpture, 3 ear, 4 song, 5 deaf.	Q 22
Q 23	Here are three figures: 189. Subtract the smallest figure from the biggest and multiply the result by the figure printed immediately before the biggest figure.	Q 23
Q 24	*Ill* means the same as... 1 health, 2 fever, 3 dirty, 4 mumps, 5 sick.	Q 24
Q 25	Write down the number of letters in the fourth word of this sentence.	Q 25
Q 26	*Near* means the opposite of... 1 close, 2 road, 3 speed, 4 far, 5 distance.	Q 26
Q 27	2, 3, 5, 8, 12... What number comes next?	Q 27
Q 28	*Legs* are to *running* as *teeth* are to... 1 chattering, 2 walking, 3 eating, 4 biting, 5 arms.	Q 28
Q 29	Here are three figures: 672. Add the largest two figures together and divide the total by the smallest figure.	Q 29
Q 30	*Scarce* means the same as... 1 unobtainable, 2 lack, 3 unique, 4 rare, 5 frightened.	Q 30

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Q 31	If Z is the last letter of the alphabet and if B does not come before A, write down the fifth of these figures: 1, 2, 3, 4, 5, 6, 7, 8, 9. Otherwise, write down the last one.	Q 31
Q 32	*Never* means the opposite of... [1] rarely, [2] always, [3] now, [4] will, [5] forget.	Q 32
Q 33	1, 2, 4, 5, 7... What number comes next?	Q 33
Q 34	*Sky* is to *ground* as *ceiling* is to... [1] roof, [2] down, [3] floor, [4] rug, [5] high.	Q 34
Q 35	Here are three figures: 823. Divide the biggest figure by the smallest and add the result to the figure printed immediately after the smallest figure.	Q 35
Q 36	*Odd* means the same as... [1] strange, [2] even, [3] one, [4] man, [5] number.	Q 36
Q 37	If 8 is more than 3, write down 7, unless 3 is more than 7, in which case write 8.	Q 37
Q 38	*War* means the opposite of... [1] suffering, [2] joy, [3] dictatorship, [4] inflation, [5] peace.	Q 38
Q 39	11, 12, 10, 13, 9... What number comes next?	Q 39
Q 40	*When* is to *where* as *time* is to... [1] how, [2] why, [3] space, [4] length, [5] relativity.	Q 40
Q 41	Here is a row of figures: 1, 2, 3, 4, 5, 6, 7, 8, 9. Write down the figure from this row which, when added to another number smaller than it, would make 17.	Q 41
Q 42	*Backwards* means the same as... [1] upside-down, [2] reversed, [3] stop, [4] forwards, [5] gear.	Q 42
Q 43	If 20 is more than 3 times 5, write down the figure 2, unless 14 is less than 16, in which case write 7.	Q 43
Q 44	*Multiplication* is the opposite of... [1] subtraction, [2] addition, [3] mathematics, [4] figures, [5] division.	Q 44
Q 45	0·9, 1·1, 1·3, 1·5, 1·7... What number comes next?	Q 45

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Q 46	*Autumn* is to *Winter* as *October* is to... [1] April, [2] July, [3] Spring, [4] rain, [5] January.	Q 46
Q 47	Here are three figures: 456. Subtract the smallest figure from the biggest and multiply the result by the figure printed immediately before the biggest figure.	Q 47
Q 48	*Prevent* means the same as... [1] avoid, [2] cure, [3] allow, [4] deter, [5] help.	Q 48
Q 49	Write down the total number of letters contained in the words in this sentence.	Q 49
Q 50	*Permanent* means the opposite of... [1] part-time, [2] ever, [3] changing, [4] temporary, [5] stable.	Q 50
Q 51	100, 81, 64, 49, 36... What number comes next?	Q 51
Q 52	*Fact* is to *fiction* as *historian* is to... [1] history, [2] book, [3] novelist, [4] teacher, [5] story.	Q 52
Q 53	Here are three figures: 934. Divide the biggest figure by the smallest and add the result to the figure printed immediately after the smallest figure.	Q 53
Q 54	*Industrious* means the same as... [1] busy, [2] hard-working, [3] energetic, [4] overworked, [5] happy.	Q 54
Q 55	If G is the seventh letter of the alphabet and Wednesday is not a month of the year, divide 63 by 7. Otherwise subtract 3 from 5. Write down your answer.	Q 55
Q 56	*Dangerous* means the opposite of... [1] brave, [2] cowardly, [3] situation, [4] safe, [5] bravado.	Q 56
Q 57	0·1, 1·3, 2·5, 3·7, 4·9... What number comes next?	Q 57
Q 58	*Motive* is to *method* as *why* is to... [1] wherefore, [2] reason, [3] how, [4] because, [5] where.	Q 58
Q 59	Here are three figures: 847. Divide the biggest figure by the smallest and add the result to the figure printed immediately after the smallest figure.	Q 59
Q 60	*Flat* means the same as... [1] straight, [2] level, [3] uneven, [4] oblique, [5] inclined.	Q 60

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Q 61	0, 2, 8, 26, 80... What number comes next?	Q 61
Q 62	*Doubt* means the opposite of... [1] wonder, [2] certainty, [3] correct, [4] dubious, [5] indefinite.	Q 62
Q 63	130, 118, 107, 97, 88... What number comes next?	Q 63
Q 64	*The day after tomorrow* is to *the day before yesterday* as *Wednesday* is to [1] Friday, [2] Saturday, [3] Sunday, [4] Monday, [5] Tuesday.	Q 64
Q 65	Here are three figures: 948. Divide the biggest figure by the smallest and add the result to the figure printed immediately after the smallest figure.	Q 65

END OF PART I

DO NOT TURN OVER UNTIL YOU ARE TOLD TO DO SO

297

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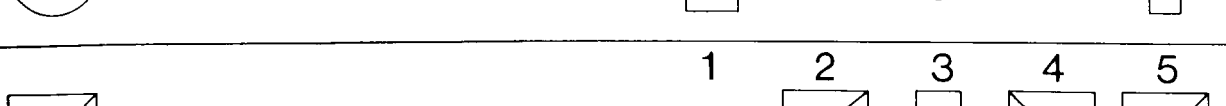
3		3
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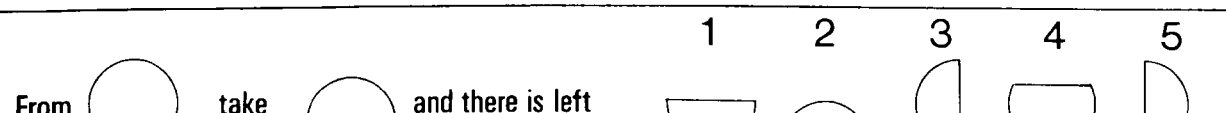
6		6
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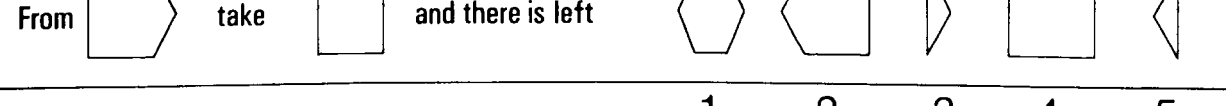
8		8
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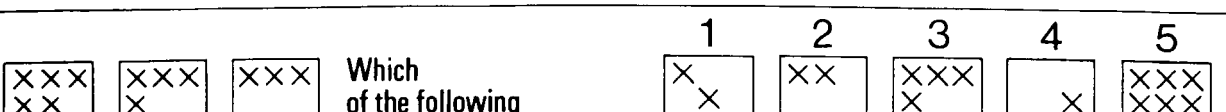
10		10

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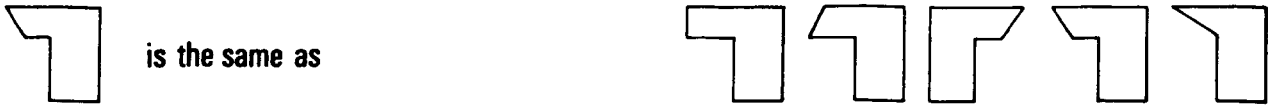
2		2
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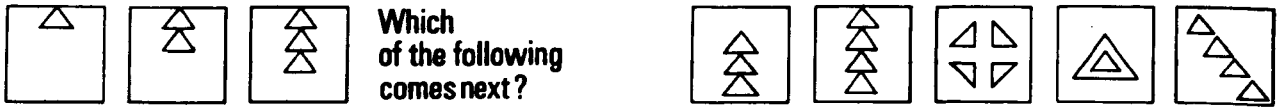
4		4
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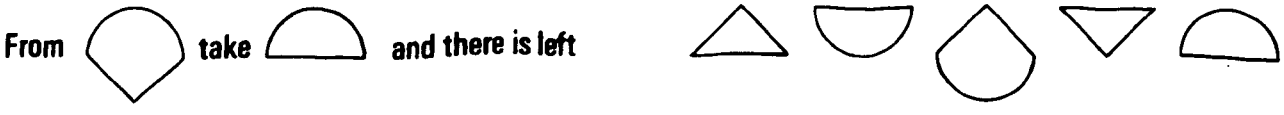
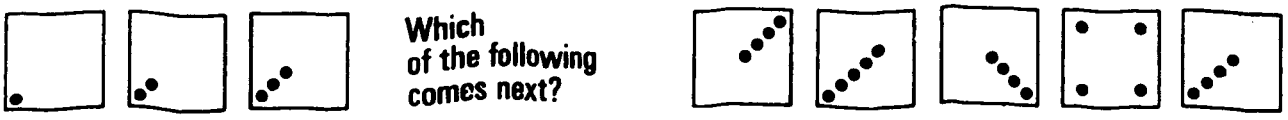
8		8
9		9

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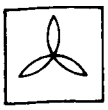
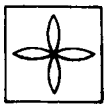
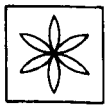
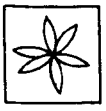
Q.No. DO NOT WRITE ANYTHING ON THIS PAPER Q.No.

10  placed exactly on top of  gives the following outline

1  2  3  4  5  **10**

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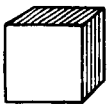
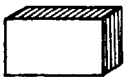
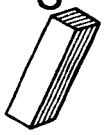
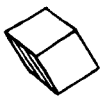
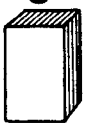
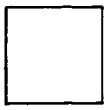
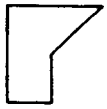
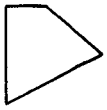
1  2  3  4  5  **11**

12  is the same as

1  2  3  4  5  **12**

13 From  take  and there is left

1  2  3  4  5  **13**

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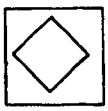
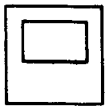
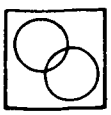
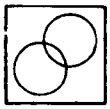
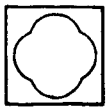
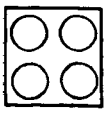
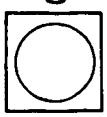
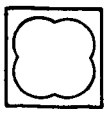
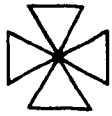
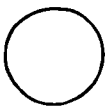
1  2  3  4  5  **14**

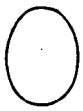
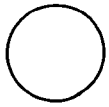
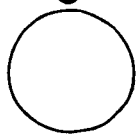
15  placed exactly on top of  gives the following outline

1  2  3  4  5  **15**

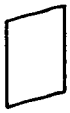
16  is to  as  is to

1  2  3  4  5  **16**

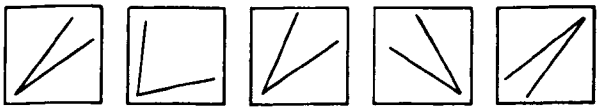
17  is the same as

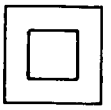
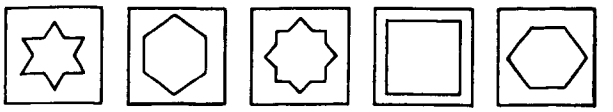
1  2  3  4  5  **17**

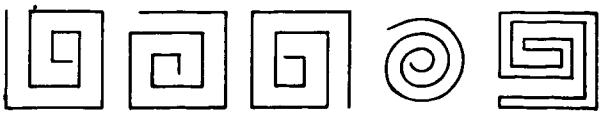
18 From  take  and there is left

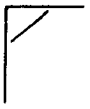
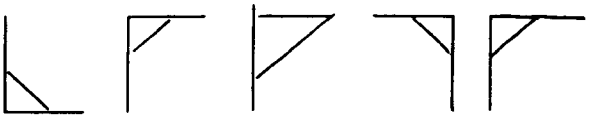
1  2  3  4  5  **18**

Q.No. DO NOT WRITE ANYTHING ON THIS PAPER Q.No.

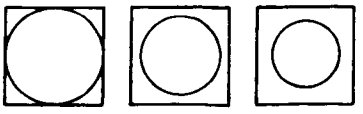
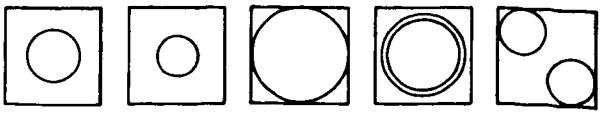
19  Which of the following comes next? 1 2 3 4 5  **19**

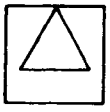
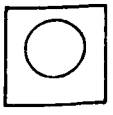
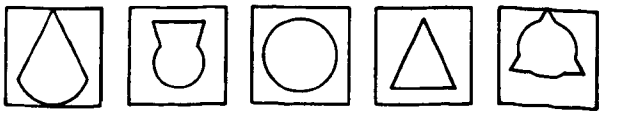
20  placed exactly on top of  gives the following outline 1 2 3 4 5  **20**

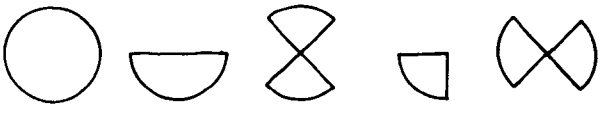
21  1 2 3 4 5  **21**

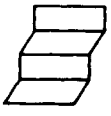
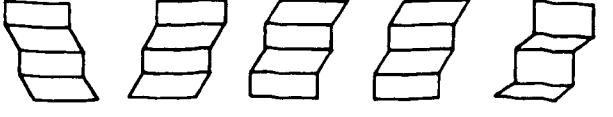
22  is the same as 1 2 3 4 5  **22**

23 From  take  and there is left 1 2 3 4 5  **23**

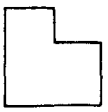
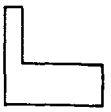
24  Which of the following comes next? 1 2 3 4 5  **24**

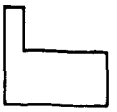
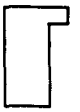
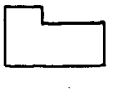
25  placed exactly on top of  gives the following outline 1 2 3 4 5  **25**

26  1 2 3 4 5  **26**

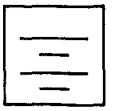
27  is the same as 1 2 3 4 5  **27**

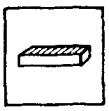
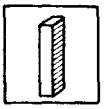
Q.No. DO NOT WRITE ANYTHING ON THIS PAPER Q.No.

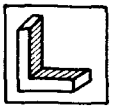
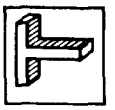
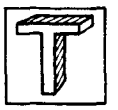
28 From  take  and there is left

1  2  3  4  5  **28**

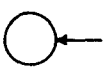
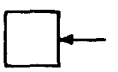
29  Which of the following comes next?

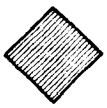
1  2  3  4  5  **29**

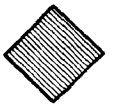
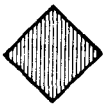
30  placed exactly on top of  gives the following outline

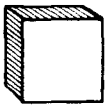
1  2  3  4  5  **30**

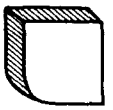
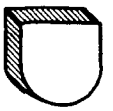
31  is to  as  is to

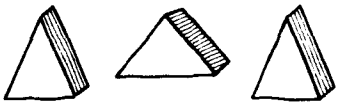
1  2  3  4  5  **31**

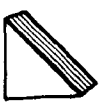
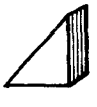
32  is the same as

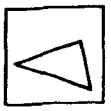
1  2  3  4  5  **32**

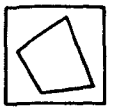
33 From  take  and there is left

1  2  3  4  5  **33**

34  Which of the following comes next?

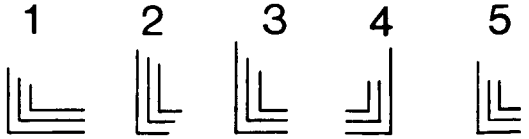
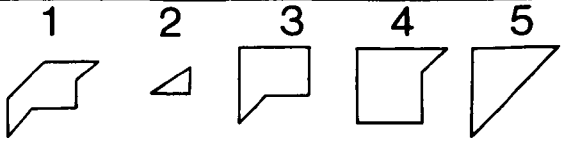
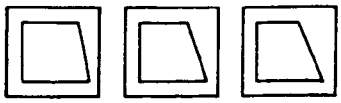
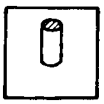
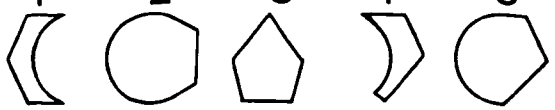
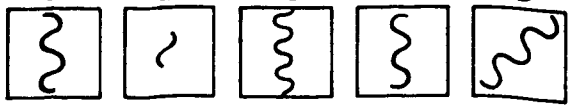
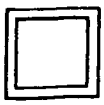
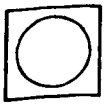
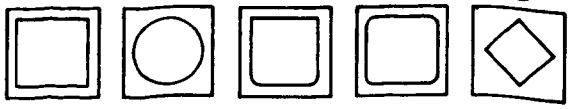
1  2  3  4  5  **34**

35  placed exactly on top of  gives the following outline

1  2  3  4  5  **35**

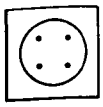
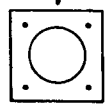
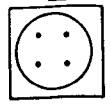
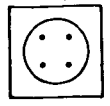
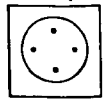
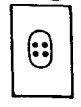
36  is to  as  is to

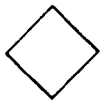
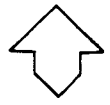
1  2  3  4  5  **36**

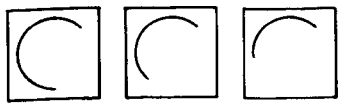
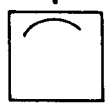
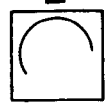
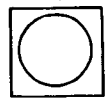
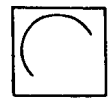
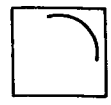
Q.No.	DO NOT WRITE ANYTHING ON THIS PAPER	Q.No.
37	 is the same as 	37
38	From  take  and there is left 	38
39	 Which of the following comes next? 	39
40	 placed exactly on top of  gives the following outline 	40
41	 is to  as  is to 	41
42	 is the same as 	42
43	From  take  and there is left 	43
44	 Which of the following comes next? 	44
45	 placed exactly on top of  gives the following outline 	45
46	 is to  as  is to 	46

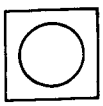
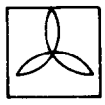
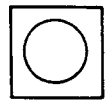
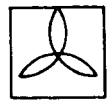
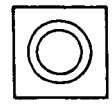
300.

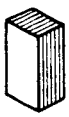
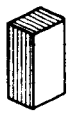
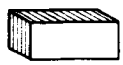
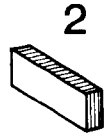
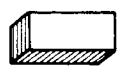
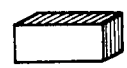
Q.No. DO NOT WRITE ANYTHING ON THIS PAPER Q.No.

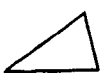
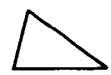
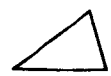
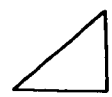
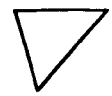
47  is the same as 1  2  3  4  5  **47**

48 From  take  and there is left 1  2  3  4  5  **48**

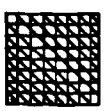
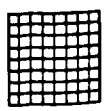
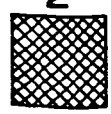
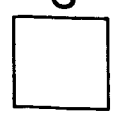
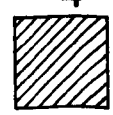
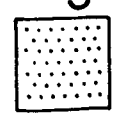
49  Which of the following comes next? 1  2  3  4  5  **49**

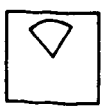
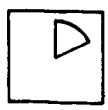
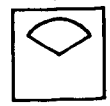
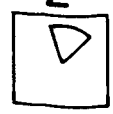
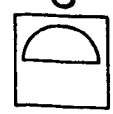
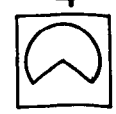
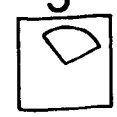
50  placed exactly on top of  gives the following outline 1  2  3  4  5  **50**

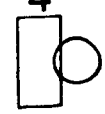
51  is to  as  is to 1  2  3  4  5  **51**

52  is the same as 1  2  3  4  5  **52**

53 From  take  and there is left 1  2  3  4  5  **53**

54    Which of the following comes next? 1  2  3  4  5  **54**

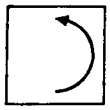
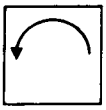
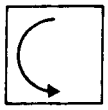
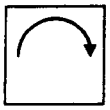
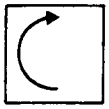
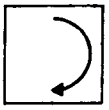
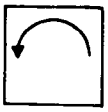
55  placed exactly on top of  gives the following outline 1  2  3  4  5  **55**

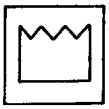
56  is to  as  is to 1  2  3  4  5  **56**

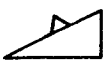
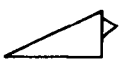
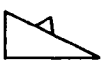
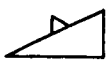
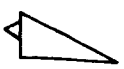
Q.No. DO NOT WRITE ANYTHING ON THIS PAPER Q.No.

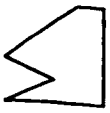
57  is the same as 1  2  3  4  5  **57**

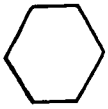
58 From  take  and there is left 1  2  3  4  5 **58**

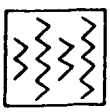
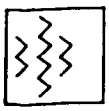
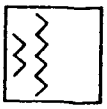
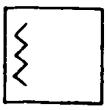
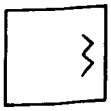
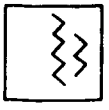
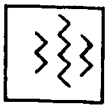
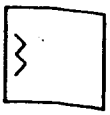
59    Which of the following comes next? 1  2  3  4  5  **59**

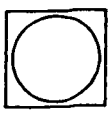
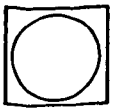
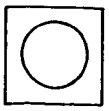
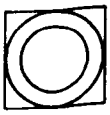
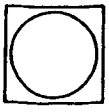
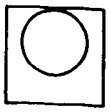
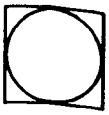
60  placed exactly on top of  gives the following outline 1  2  3  4  5  **60**

61  is to  as  is to 1  2  3  4  5  **61**

62  is the same as 1  2  3  4  5  **62**

63 From  take  and there is left 1  2  3  4  5  **63**

64    Which of the following comes next? 1  2  3  4  5  **64**

65  placed exactly on top of  gives the following outline 1  2  3  4  5  **65**

END OF PART II

Appendix 3. Likert-Type Test (Pilot)

Pretest Questionnaire

Name: Age: Sex:

Instructions:

S.A. = Strongly agree
A. = Agree
N. = Neutral, neither agree nor disagree
D. = Disagree
S.D. = Strongly disagree

Make a circle around the appropriate letter, e.g., if you strongly agree with the statement, then (S.A.)

Answer the following statements in exactly the way you think about them. There are no right or wrong answers to any of them. It is what you think that matters. Be honest. Your answers are not used to please anybody, and have no effect whatever on you.

It is important to answer all statements, and you should work as rapidly as you can.

S.A./A./N./D./S.D. 1. I do not like school work.
S.A./A./N./D./S.D. 2. I like studying with friends.
S.A./A./N./D./S.D. 3. I feel happy at home.
S.A./A./N./D./S.D. 4. I enjoy discussing problems with friends.
S.A./A./N./D./S.D. 5. I hate going out with friends.
S.A./A./N./D./S.D. 6. I can spend the whole evening talking with friends.
S.A./A./N./D./S.D. 7. I don't like dancing.
S.A./A./N./D./S.D. 8. I don't like playing card games.
S.A./A./N./D./S.D. 9. I would rather leave home.
S.A./A./N./D./S.D. 10. I enjoy acting as leader in a group.
S.A./A./N./D./S.D. 11. I like to entertain friends in my home.
S.A./A./N./D./S.D. 12. I prefer working outside to studying in school.
S.A./A./N./D./S.D. 13. I find school life dull.
S.A./A./N./D./S.D. 14. Home is a wonderful place for me.
S.A./A./N./D./S.D. 15. We are lucky to have a home.
S.A./A./N./D./S.D. 16. I like to help my friends.
S.A./A./N./D./S.D. 17. I consider working in a summer camp a waste of time.
S.A./A./N./D./S.D. 18. I spend a lot of time visiting friends.
S.A./A./N./D./S.D. 19. I am never very good in examinations.
S.A./A./N./D./S.D. 20. It is nice to be a boy scout or girl guide.
S.A./A./N./D./S.D. 21. It is an honour to be a class monitor or monitress.
S.A./A./N./D./S.D. 22. My parents love me very much.
S.A./A./N./D./S.D. 23. I would rather stay away from home.
S.A./A./N./D./S.D. 24. I feel safe at home.
S.A./A./N./D./S.D. 25. School is just not the place for me.
S.A./A./N./D./S.D. 26. Nothing is better than success in life.
S.A./A./N./D./S.D. 27. I like participating in club activities.
S.A./A./N./D./S.D. 28. When I solve a problem, I have a great sense of satisfaction.

S.A./A./N./D./S.D. 29. I would prefer enjoying myself when I am still young.
S.A./A./N./D./S.D. 30. I like organising parties.
S.A./A./N./D./S.D. 31. I feel rather lost when I am away from home.
S.A./A./N./D./S.D. 32. It is a pity that one has to leave home some time.
S.A./A./N./D./S.D. 33. I enjoy being praised by my teachers.
S.A./A./N./D./S.D. 34. I like to hear people saying nice things about a home.
S.A./A./N./D./S.D. 35. I am only in school because my parents send me here.
S.A./A./N./D./S.D. 36. I like to be with my friends rather than my parents.
S.A./A./N./D./S.D. 37. I think life would be better if we could live anywhere.
S.A./A./N./D./S.D. 38. I like meeting people from other countries.
S.A./A./N./D./S.D. 39. I don't like to go to parties.
S.A./A./N./D./S.D. 40. I only think of home when I am unhappy or sick.
S.A./A./N./D./S.D. 41. I feel more at ease when my parents are not at home.
S.A./A./N./D./S.D. 42. I study hard in school not to disappoint my parents.
S.A./A./N./D./S.D. 43. I don't aim at university.
S.A./A./N./D./S.D. 44. I am always pleased to find out where I am wrong.
S.A./A./N./D./S.D. 45. I feel guilty when I have not tried my best.
S.A./A./N./D./S.D. 46. I am shy in the presence of opposite sex.
S.A./A./N./D./S.D. 47. I just take things easy.
S.A./A./N./D./S.D. 48. I value friendship.
S.A./A./N./D./S.D. 49. I don't mind very much about my school results.
S.A./A./N./D./S.D. 50. Home is a terrible place for most people.
S.A./A./N./D./S.D. 51. I think of home all the time.
S.A./A./N./D./S.D. 52. I never feel homesick when I am away for some time.
S.A./A./N./D./S.D. 53. I prefer staying at school rather than going home.
S.A./A./N./D./S.D. 54. I like making new friends all the time.
S.A./A./N./D./S.D. 55. I go out with friends very often.
S.A./A./N./D./S.D. 56. I don't read a lot of reference books.
S.A./A./N./D./S.D. 57. I like to stay at home as much of the time as possible.
S.A./A./N./D./S.D. 58. I dislike everything at home.
S.A./A./N./D./S.D. 59. I just could not get along with all people at home.
S.A./A./N./D./S.D. 60. At home everything seems to be against me.

S.A./A./N./D./S.D. 61. I feel lonely at home.
S.A./A./N./D./S.D. 62. I don't care very much about home.
S.A./A./N./D./S.D. 63. In order to get a better job, I must succeed in my studies.
S.A./A./N./D./S.D. 64. I enjoy myself most when I have company.
S.A./A./N./D./S.D. 65. My parents always comfort me whenever I am upset in school.
S.A./A./N./D./S.D. 66. I don't care very much what others think of me.
S.A./A./N./D./S.D. 67. I have several very good close friends with whom I can share my troubles and happiness.
S.A./A./N./D./S.D. 68. I am not friendly to some people.
S.A./A./N./D./S.D. 69. Whenever I meet a friend, I find I keep him talking for a long time.
S.A./A./N./D./S.D. 70. I try to work hard in class.
S.A./A./N./D./S.D. 71. I am interested to discover new things from books.
S.A./A./N./D./S.D. 72. I am ashamed of my family.
S.A./A./N./D./S.D. 73. I would like to relax at home.
S.A./A./N./D./S.D. 74. I usually could not get along with people easily.
S.A./A./N./D./S.D. 75. Home is good for all people.
S.A./A./N./D./S.D. 76. I can never find peace at home.
S.A./A./N./D./S.D. 77. I like to help others have a good time.
S.A./A./N./D./S.D. 78. I feel happiest when there are people around.
S.A./A./N./D./S.D. 79. I always try to improve myself.
S.A./A./N./D./S.D. 80. I like to talk about home to my friends.
S.A./A./N./D./S.D. 81. I like to be by myself.
S.A./A./N./D./S.D. 82. I wish my parents would be with me all my life.
S.A./A./N./D./S.D. 83. My parents are always finding fault with me.
S.A./A./N./D./S.D. 84. I just do what the teachers tell me.
S.A./A./N./D./S.D. 85. I usually do more than the school assignments.
S.A./A./N./D./S.D. 86. Examinations are the opportunity for me to show my ability.
S.A./A./N./D./S.D. 87. My parents understand me.
S.A./A./N./D./S.D. 88. I find it difficult to see other people's point of view.
S.A./A./N./D./S.D. 89. I am anxious in passing any examination.
S.A./A./N./D./S.D. 90. I value education highly.
S.A./A./N./D./S.D. 91. I don't follow what my friends do.
S.A./A./N./D./S.D. 92. I would do my best to please my friends.
S.A./A./N./D./S.D. 93. I enjoy making fun of others.
S.A./A./N./D./S.D. 94. I don't care whether I am a good student or not.
S.A./A./N./D./S.D. 95. I keep in touch with my teachers all the time.

S.A./A./N./D./S.D. 96. I like to be independent.
S.A./A./N./D./S.D. 97. I admire my teachers.
S.A./A./N./D./S.D. 98. I like to be different from others.
S.A./A./N./D./S.D. 99. My home has all the comfort in the world.
S.A./A./N./D./S.D. 100. I prefer to stay at home watching T.V. alone.
S.A./A./N./D./S.D. 101. I consider that waiting for a friend is a waste of time.
S.A./A./N./D./S.D. 102. I think all the club activities in school are rather unnecessary.
S.A./A./N./D./S.D. 103. I like to be admired by my classmates.
S.A./A./N./D./S.D. 104. I am not interested in what other people are doing.
S.A./A./N./D./S.D. 105. I care very little about my reputation.
S.A./A./N./D./S.D. 106. I like to be outstanding in class.
S.A./A./N./D./S.D. 107. I have only a few friends.
S.A./A./N./D./S.D. 108. I always try to get the best mark in examination.
S.A./A./N./D./S.D. 109. I spend a lot of time in writing letters to my friends.
S.A./A./N./D./S.D. 110. I like to learn new things.
S.A./A./N./D./S.D. 111. I don't care what my classmates think of me.
S.A./A./N./D./S.D. 112. I am never satisfied with my marks.
S.A./A./N./D./S.D. 113. I feel rather disappointed with the conditions of my home.
S.A./A./N./D./S.D. 114. I like going out alone.
S.A./A./N./D./S.D. 115. I would never use my leisure time for study.
S.A./A./N./D./S.D. 116. There are other things more important than study.
S.A./A./N./D./S.D. 117. I am proud of my family.
S.A./A./N./D./S.D. 118. Sometimes I daydream in class.
S.A./A./N./D./S.D. 119. I like going to the cinema with a number of friends.
S.A./A./N./D./S.D. 120. I appreciate my parents' effort in providing everything I need.
S.A./A./N./D./S.D. 121. I get along well with my brothers and sisters.
S.A./A./N./D./S.D. 122. I can do my work better by myself.
S.A./A./N./D./S.D. 123. I always like to have company.
S.A./A./N./D./S.D. 124. My friends bring me happiness.
S.A./A./N./D./S.D. 125. I never give up trying to solve a problem in school work.
S.A./A./N./D./S.D. 126. I never pay any attention to my teachers' remarks of my work.

S.A./A./N./D./S.D. 127. I never bother to think about what to do tomorrow.
S.A./A./N./D./S.D. 128. I enjoy going for a walk with friends.
S.A./A./N./D./S.D. 129. I sometimes quarrel with my brothers and sisters.
S.A./A./N./D./S.D. 130. I enjoy listening to records with friends.
S.A./A./N./D./S.D. 131. At home I am never free to do what I want.
S.A./A./N./D./S.D. 132. I am not a member of a youth club.
S.A./A./N./D./S.D. 133. My parents do not allow me to go out by myself.
S.A./A./N./D./S.D. 134. I am always behind my teachers in the lessons.
S.A./A./N./D./S.D. 135. I hate to miss any lesson.
S.A./A./N./D./S.D. 136. I am not interested in what other people say.
S.A./A./N./D./S.D. 137. I am sometimes impatient with others.
S.A./A./N./D./S.D. 138. Very often I am misunderstood by others.
S.A./A./N./D./S.D. 139. I usually blame others for mistakes.
S.A./A./N./D./S.D. 140. My parents like me.
S.A./A./N./D./S.D. 141. My parents like my brothers and sisters more than me.
S.A./A./N./D./S.D. 142. When I am in difficulty, my parents always give their advice.
S.A./A./N./D./S.D. 143. Friends are more helpful than parents.
S.A./A./N./D./S.D. 144. I like to be busy with work.
S.A./A./N./D./S.D. 145. I like to spend most of my time with my parents.
S.A./A./N./D./S.D. 146. I don't mind going to school or not.
S.A./A./N./D./S.D. 147. What I learn in school will not help my future career.
S.A./A./N./D./S.D. 148. I always take the advice of my teachers.
S.A./A./N./D./S.D. 149. I am contented to be in the middle of the class in examination.
S.A./A./N./D./S.D. 150. I like to know how my friends are getting on in other places.
S.A./A./N./D./S.D. 151. I like to be praised by other people.
S.A./A./N./D./S.D. 152. I always try to be helpful to others.
S.A./A./N./D./S.D. 153. I don't feel upset when I fail in examination.
S.A./A./N./D./S.D. 154. I like to work with my parents.
S.A./A./N./D./S.D. 155. It is silly to let examinations spoil one's life.
S.A./A./N./D./S.D. 156. I have confidence in my parents.

S.A./A./N./D./S.D. 157. I admire my parents.
S.A./A./N./D./S.D. 158. I don't participate actively in class.
S.A./A./N./D./S.D. 159. I wish I could help my parents in their work.
S.A./A./N./D./S.D. 160. My chief aim in school is to do well.
S.A./A./N./D./S.D. 161. I don't care what my brothers and sisters are doing.
S.A./A./N./D./S.D. 162. I always try to get to know all people around me.
S.A./A./N./D./S.D. 163. My main interest in school is to have a nice time with my classmates.
S.A./A./N./D./S.D. 164. I don't care what my parents think of me.
S.A./A./N./D./S.D. 165. I don't feel anything when my parents are not at home.
S.A./A./N./D./S.D. 166. I don't know what to say to strangers.
S.A./A./N./D./S.D. 167. I don't get to know people easily.
S.A./A./N./D./S.D. 168. I shall never be able to understand my parents.
S.A./A./N./D./S.D. 169. I find it difficult to discuss my problems with my parents.
S.A./A./N./D./S.D. 170. I spend very little time at home.
S.A./A./N./D./S.D. 171. My friends take up very much of my time.
S.A./A./N./D./S.D. 172. My parents often ask about my schoolwork.
S.A./A./N./D./S.D. 173. I always try to avoid my parents.
S.A./A./N./D./S.D. 174. My parents deserve my respect.
S.A./A./N./D./S.D. 175. I am not keen in winning prizes.
S.A./A./N./D./S.D. 176. I wish I could stay with my brothers and sisters all my life.
S.A./A./N./D./S.D. 177. It is nice to get a prize at the end of the school year.
S.A./A./N./D./S.D. 178. I want to know more.
S.A./A./N./D./S.D. 179. Everything I learn in school has some use in future.
S.A./A./N./D./S.D. 180. It is not worthwhile spending time in the library.

Appendix 4. Likert-Type Test (Final)

Questionnaire

Name: Sex: Age:

Instructions:

S.A. = Strongly agree
A. = Agree
N. = Neutral, neither agree nor disagree
D. = Disagree
S.D. = Strongly disagree

Make a circle around the appropriate letter, e.g., if you strongly agree with the statement, then (S.A.)

Answer the following statements in exactly the way you think about them. There are no right or wrong answers to any of them. It is what you think that matters. Be honest. Your answers are not used to please anybody, and have no effect whatever on you.

It is important to answer all statements, and should work as rapidly as you can.

S.A./A./N./D./S.D. 1. I feel happy at home.

S.A./A./N./D./S.D. 2. I can spend the whole evening talking with friends.

S.A./A./N./D./S.D. 3. I would rather leave home.

S.A./A./N./D./S.D. 4. I enjoy acting as leader in a group.

S.A./A./N./D./S.D. 5. I prefer working outside to studying in school.

S.A./A./N./D./S.D. 6. I find school life dull.

S.A./A./N./D./S.D. 7. I like to help my friends.

S.A./A./N./D./S.D. 8. I spend a lot of time visiting friends.

S.A./A./N./D./S.D. 9. I am never very good in examinations.

S.A./A./N./D./S.D. 10. School is just not the place for me.

S.A./A./N./D./S.D. 11. Nothing is better than success in life.

S.A./A./N./D./S.D. 12. I like participating in club activities.

S.A./A./N./D./S.D. 13. When I solve a problem, I have a great sense of satisfaction.

S.A./A./N./D./S.D. 14. I would prefer enjoying myself when I am still young.

S.A./A./N./D./S.D. 15. I like organising parties.

S.A./A./N./D./S.D. 16. I feel rather lost when I am away from home.

S.A./A./N./D./S.D. 17. I am only in school because my parents send me here.

S.A./A./N./D./S.D. 18. I like to be with my friends rather than my parents.

S.A./A./N./D./S.D. 19. I like meeting people from other countries.

S.A./A./N./D./S.D. 20. I don't aim at university.

S.A./A./N./D./S.D. 21. I value friendship.

S.A./A./N./D./S.D. 22. I don't mind very much about my school results.

S.A./A./N./D./S.D. 23. I think of home all the time.

S.A./A./N./D./S.D. 24. I like making new friends all the time.

S.A./A./N./D./S.D. 25. I go out with friends very often.

S.A./A./N./D./S.D. 26. I like to stay at home as much of the time as possible.

S.A./A./N./D./S.D. 27. At home everything seems to be against me.

S.A./A./N./D./S.D. 28. I feel lonely at home.

S.A./A./N./D./S.D. 29. My parents always comfort me whenever I am upset in school.

S.A./A./N./D./S.D. 30. I don't care very much what others think of me.

S.A./A./N./D./S.D. 31. Whenever I meet a friend, I find I keep him talking for a long time.

S.A./A./N./D./S.D., 32. I am interested to discover new things from books.

S.A./A./N./D./S.D. 33. I am ashamed of my family.

S.A./A./N./D./S.D. 34. I can never find peace at home.

S.A./A./N./D./S.D. 35. I feel happiest when there are people around.

S.A./A./N./D./S.D. 36. I always try to improve myself.

S.A./A./N./D./S.D. 37. I like to be by myself.

S.A./A./N./D./S.D. 38. I wish my parents would be with me all my life.

S.A./A./N./D./S.D. 39. My parents are always finding fault with me.

S.A./A./N./D./S.D. 40. Examinations are the opportunity for me to show my ability.

S.A./A./N./D./S.D. 41. My parents understand me.

S.A./A./N./D./S.D. 42. I value education highly.

S.A./A./N./D./S.D. 43. I don't follow what my friends do.

S.A./A./N./D./S.D. 44. I would do my best to please my friends.

S.A./A./N./D./S.D. 45. I enjoy making fun of others.

S.A./A./N./D./S.D. 46. I don't care whether I am a good student or not.

S.A./A./N./D./S.D. 47. I like to be different from others.

S.A./A./N./D./S.D. 48. My home has all the comfort in the world.

S.A./A./N./D./S.D. 49. I am not interested in what other people are doing.

S.A./A./N./D./S.D. 50. I like to learn new things.

S.A./A./N./D./S.D. 51. I don't care what my classmates think of me.

S.A./A./N./D./S.D. 52. I feel rather disappointed with the conditions of my home.

S.A./A./N./D./S.D. 53. I would never use my leisure time for study.

S.A./A./N./D./S.D. 54. There are other things more important than study.

S.A./A./N./D./S.D. 55. I am proud of my family.

S.A./A./N./D./S.D. 56. I like going to the cinema with a number of friends.

S.A./A./N./D./S.D. 57. I never pay any attention to my teachers' remarks of my work.

S.A./A./N./D./S.D. 58. I never bother to think about what to do tomorrow.

S.A./A./N./D./S.D. 59. I enjoy going for a walk with friends.

S.A./A./N./D./S.D. 60. I sometimes quarrel with my brothers and sisters.

S.A./A./N./D./S.D. 61. I enjoy listening to records with friends.

S.A./A./N./D./S.D. 62. At home I am never free to do what I want.

S.A./A./N./D./S.D. 63. My parents do not allow me to go out by myself.

S.A./A./N./D./S.D. 64. I am not interested in what other people say.

S.A./A./N./D./S.D. 65. I am sometimes impatient with others.

S.A./A./N./D./S.D. 66. Very often I am misunderstood by others.

S.A./A./N./D./S.D. 67. My parents like me.

S.A./A./N./D./S.D. 68. My parents like my brothers and sisters more than me.

S.A./A./N./D./S.D. 69. When I am in difficulty, my parents always give their advice.

S.A./A./N./D./S.D. 70. I like to spend most of my time with my parents.

S.A./A./N./D./S.D. 71. I don't mind going to school or not.

S.A./A./N./D./S.D. 72. What I learn in school will not help my future career.

S.A./A./N./D./S.D. 73. I like to know how my friends are getting on in other places.

S.A./A./N./D./S.D. 74. I always try to be helpful to others.

S.A./A./N./D./S.D. 75. I don't feel upset when I fail in examination.

S.A./A./N./D./S.D. 76. I like to work with my parents.

S.A./A./N./D./S.D. 77. I wish I could help my parents in their work.

S.A./A./N./D./S.D. 78. My main interest in school is to have a nice time with my classmates.

S.A./A./N./D./S.D. 79. I don't care what my parents think of me.

S.A./A./N./D./S.D. 80. I don't get to know people easily.

S.A./A./N./D./S.D. 81. I find it difficult to discuss my problems with my parents.

S.A./A./N./D./S.D. 82. I spend very little time at home.

S.A./A./N./D./S.D. 83. My friends take up very much of my time.

S.A./A./N./D./S.D. 84. My parents often ask about my schoolwork.

S.A./A./N./D./S.D. 85. I always try to avoid my parents.

S.A./A./N./D./S.D. 86. I wish I could stay with my brothers and sisters all my life.

S.A./A./N./D./S.D. 87. It is nice to get a prize at the end of the school year.

S.A./A./N./D./S.D. 88. Everything I learn in school has some use in future.

S.A./A./N./D./S.D. 89. It is not worthwhile spending time in the library.

Appendix 5. Sentence Completion Test

Sentence Completion

Name: Sex: Age:

Instructions

Complete the following sentences in exactly the way you think about them. There are no right or wrong answers to any of them. It is what you think that matters. Be honest. Your answers are not used to please anybody, and have no effect whatever on you.

It is important to finish all sentences. There is no time limit, but you should work as rapidly as you can.

1. Getting good marks in school is .....
2. If I am late for school, I feel .....
3. When my friends need help, I .....
4. Prizes and scholarships are .....
5. If my parents are not happy, I feel .....
6. When my friends are sick, I .....
7. When my classmates borrow my notes, I .....
8. Whenever I go out with my parents, I .....
9. I think teachers are .....
10. My future plan is .....
11. Things at home are .....
12. School life is .....
13. If I do not succeed in my first attempt, I .....
14. If my friend fails in examination, I .....
15. If my friend annoys me, I .....
16. Success in school is .....
17. Most things I learn in school are .....
18. I think most parents are .....,.....

19. I am interested in .....
20. When I am in a party, I .....
21. When I think of home, I .....
22. When a stranger sits beside me, I .....
23. When people look at me, I feel .....
24. When I am neglected, I feel .....
25. My aim in life is .....
26. When my parents ask me about my schoolwork, I feel ....
27. When somebody is unkind to me, I .....
28. When my mother is alone with me, I feel .....
29. If I do not agree with my friends, I .....
30. If someone bothers me when I am busy, I .....
31. The rules set by my parents are .....
32. I think university education is .....
33. When my friends leave me, I feel .....
34. When I think of my parents, I .....
35. Compared with school, home is .....
36. When I am at home, I feel .....
37. As soon as I finish school, I .....
38. If my friend gets angry with me, I .....
39. If my examination results are not good this time, I ...
40. I study for .....

41. If I could not finish my homework in time, I .....
42. To stay at home is .....
43. If my classmates laugh at me, I .....
44. To do better than others is .....
45. When there is some difficult work, I .....
46. When I am invited to a party, I feel .....
47. Compared with teachers, my parents are .....
48. Talking to friends is .....
49. After I have done my homework, I .....
50. Home is the place where .....
51. Studying with friends is .....
52. Studying hard is .....
53. When I am alone with my father, I feel .....
54. Friendship to me is .....
55. When I am upset by things at school, my parents .....
56. What we learn at home are .....
57. Compared with friends, my brothers and sisters are ...
58. Writing letters to friends is .....
59. When I am sick, my parents .....
60. When I fail to do well in examination, my parents ....

Appendix 6. Composition Test

Name: Sex: Age:

Write about half page on "My Family Life".

Appendix 7. Popularity Test

1. Write down the names of 5 students whom you like most in your class -

2. Write down the names of 5 students whom you like least in your class -

(b) Marking Schemes

Appendix 8. SENTENCE COMPLETION MARKING SCHEME

Attitude to Home

1. If my parents are not happy, I feel .....

   Score 1: to leave them, troublesome

   Score 2: nothing, as usual

   Score 3: am frightened, rather dull, sorry, uncomfortable, I have done something wrong, nervous, worried, unpleasant

   Score 4: sad, quite upset, unhappy, comfort them, will not leave them

   Score 5: very sad, very miserable

2. Whenever I go out with my parents, I .....

   Score 1: hate, feel very dull, feel unfree, keep silent, feel unhappy, feel upset, don't like it, feel troublesome, think I were a prisoner, feel being controlled, impatient

   Score 2: have trouble, feel dull, have to behave well, don't like my parents talking about me in the public

   Score 3: don't mind, feel nothing

   Score 4: feel eager, feel happy, feel cheerful, feel my parents are protecting me, feel safe, feel exciting, pleased, eat a lot

   Score 5: feel very happy, enjoy myself, feel very comfortable

3. Things at home are .....

   Score 1: awful, terrible, dull, making me sick, poor, miserable, bad, against me, not important, hindering

   Score 2: not very nice, not as good as they should be, not well

   Score 3: ours, valuable, neat, ordinary, clear, tidy, common, tiny

   Score 4: good, nice, fine, sweet, comfortable, suitable, useful, so safe, satisfactory, lovely, happy, all right, interesting, beautiful, necessary, warm, busy, essential, convenient

   Score 5: very good, very pleasant, wonderful

4. I think most parents are .....

Score 1: not kind, not good, strict, selfish, soft

Score 2: ignorant, not educated, misunderstanding, old-fashioned

Score 3: indifferent to their children

Score 4: good, kind, fond of their children, nice, hoping to have successful children, looking after their children

Score 5: very kind to their children, admirable, doing their best to help their children, respectful, loving their children

5. When I think of home, I .....

Score 1: feel sad, better leave, try to forget, am sick, feel nothing, feel lonely, think of a cage, feel ashamed, think of all the troubles, am afraid, feel upset, feel annoyed, feel dull

Score 2: feel a gap between my brothers and me, feel hungry

Score 3: think of my family, feel happy and unhappy at different times

Score 4: feel happy, want to go home at once, feel homesick, feel safe

Score 5: feel very happy, feel sweet, feel very pleased, feel warm, think it is the safest place, am proud, feel love

6. When my parents ask me about my schoolwork, I feel .....

Score 1: very uncomfortable, trouble, unhappy, sad, annoyed, nervous, afraid, tongue-tied, angry, frightened, unnecessary, dull, upset

Score 2: shy, ashamed, strange, unexpected, uneasy, worried, guilty

Score 3: nothing, neither happy nor unhappy

Score 4: happy, pleased, excited

Score 5: very happy, they care for me, wonderful

7. When my mother is alone with me, I feel .....

Score 1: sad, lonely, very uncomfortable, she is talking too much, there is nothing to talk about, unhappy

Score 2: dull

Score 3: nothing

Score 4: safe, warm, love, happy, better, close

Score 5: very free, very happy, very comfortable, wonderful

8. The rules set by my parents are .....

Score 1: quite severe, strict, unfair to me, bad, cruel, severe, nonsense, unreasonable, not suitable, harsh, stern, unjust

Score 2: unnecessary, not useful, dull, useless

Score 3: flexible, general, common, loose, soft, free, fussy

Score 4: reasonable, suitable for me, not bad, not very strict, considerate, kind, acceptable, correct, fair, useful

Score 5: very good for me, certainly right

9. When I think of my parents, I .....

Score 1: feel poor, feel afraid, feel dull, feel sad, hate them, feel lonely, am not happy, feel they are unkind to me

Score 2: feel nothing

Score 3: feel neither happy nor unhappy

Score 4: feel happy, think of my brothers too, feel they are quite nice, would go to see them, feel they are kind, close, shall miss them, feel safe, my home, try to please, love

Score 5: feel very happy, feel they are best, pray for them, feel proud, feel they are splendid

10. Compared with school, home is .....

Score 1: bad, dull, lonely, a cage, unpleasant, small

Score 2: worse, not as good, noisy

Score 3: the same

Score 4: better, sweeter, more comfortable, warm, interesting, lovely, safer, happier, good, quieter

Score 5: important, best

11. When I am at home, I feel .....

Score 1: upset, very lonely, very uncomfortable, empty, in a cage, unfree, have to work, busy

Score 2: lonely, dull, noisy, unhappy, uncomfortable

Score 3: nothing

Score 4: safe, comfortable, easy, peace, happy, free, sweet, warm

Score 5: very happy, very warm, very safe

12. To stay at home is .....

Score 1: lonely, not good, like in a prison, a sad thing, so noisy, a waste of time, not suitable for me, not enjoyable

Score 2: difficult, dull, uninteresting

Score 3: natural, common

Score 4: happier than outside, safe, good, comfortable, necessary, interesting, better, quiet

Score 5: best, very happy, the best time

13. Compared with teachers, my parents are .....

Score 1: fierce, ignorant, useless, obstinate, foolish, bad, sterner, not suitable, old-fashioned

Score 2: worse

Score 3: the same, not the same

Score 4: better, more lonely, more experienced, closer

Score 5: much kinder, much more concerned, wonderful, more important, best, much closer

14. Home is the place where .....

Score 1: there is dispute, there is hatred, there is noise

Score 2: I do not like to stay

Score 3: I live, a needed place, a place to rest, family lives, necessary

Score 4: I can do what I want, I can study peacefully

Score 5: I can feel warm, there is comfort, there is love, there is safety, there is happiness, I love to stay

15. When I am alone with my father, I feel .....

Score 1: afraid, unhappy, sad, upset, ashamed, frightened, angry

Score 2: uneasy, dull, poor, unpleasant, uncomfortable, lonely, nothing to say, slightly afraid

Score 3: nothing, ordinary, usual

Score 4: happy, comfortable, safe, fine, close

Score 5: very happy

16. When I am upset by things at school, my parents .....

Score 1: feel nothing, blame me, are angry, curse me, scold me, punish me, neglect me

Score 2: never know, won't comfort me, do not care

Score 3: do nothing

Score 4: are sad, will do something, are unhappy, ask why, feel angry

Score 5: advise me, encourage me, comfort me, make me happy

17. What we learn at home are .....

Score 1: useless in society, rubbish, superstitious, unnecessary

Score 2: nothing, dull, uninteresting

Score 3: things about society, both good and bad, manners, ordinary

Score 4: useful for us, helpful, important, good, interesting

Score 5: very important, valuable, very reasonable

18. Compared with friends, my brothers and sisters are .....

Score 1: not important, bad, impolite, naughty, less concerned about me, less close, less friendly, enemies

Score 2: not fond of me, worse

Score 3: the same

Score 4: better, helpful, more lovely, friendly, closer

Score 5: very kind, excellent, very important

19. When I am sick, my parents .....

Score 1: do not care much, pay no attention

Score 2: are frightened

Score 3: are kinder

Score 4: are anxious, feel sad, are worried, are not happy, will be upset

Score 5: look after me, take care of me, comfort me

20. When I fail to do well in examination, my parents .....

Score 1: curse me, blame me, get angry, scold me, insult me, punish me

Score 2: don't care, feel nothing

Score 3: will be unhappy, feel sad, feel worried

Score 4: will not blame me, comfort me

Score 5: encourage me, advise me

SENTENCE COMPLETION MARKING SCHEME

Social Interest

1. When my friends need help, I .....

Score 1: pretend that I can't help much

Score 2: give help sometimes, may help, think about it, ask about the problem, feel sad

Score 3: would like to give my advice, will be ready to give help

Score 4: would help them, shall give help, try to help wherever possible

Score 5: shall try my best to help, always give help, am very eager to help, promise to help, would be glad to help, must help, am willing to sacrifice

2. When my friends are sick, I .....

Score 1: feel impatient, feel nothing, feel happy, don't care, keep away

Score 2: feel uncomfortable, feel dull, feel lonely, feel sorry, pity them

Score 3: wish them well, give them my regards, hope they will get well quickly

Score 4: shall visit them, feel sad, call on them, am worried, say some kind words to them, shall comfort them, feel unhappy

Score 5: feel very unhappy, look after them, take care of them, spend some time with them, shall pray for them, feel sick too

3. When my classmates borrow my notes, I .....

Score 1: don't like it, refuse them, may feel unhappy, hate them, shall say that my notes are poor, am angry, feel dull

Score 2: ask them to return as soon as possible, ask them to exchange theirs with mine, ask them not to lose my notes, lend them part of the notes, shall remind them to return all the time, lend unwillingly

Score 3: do not refuse them, think about it, feel nothing, shall do my best, shall study my books

Score 4: lend them, agree, feel happy, don't mind, am willing, promise

Score 5: feel very happy, am pleased, give them at once

4. If my friend fails in examination, I .....

Score 1: laugh at him, don't care, would say 'too bad', will be happy, feel ashamed of him, discourage him, don't mind

Score 2: feel sad, pity him, feel unhappy, feel sorry, feel uncomfortable, feel upset

Score 3: feel he is poor, feel nothing

Score 4: will encourage him, comfort him, advise him to try again

Score 5: will help him, pray for him, help him in his study, will find out why he fails

5. If my friend annoys me, I .....

Score 1: feel very unhappy, quarrel with him, hate him, neglect him, feel angry, feel alone, tell him to go away, kick him out, scold him, will not talk to him any more, ignore him, annoy him in return, am no longer his friend, avoid him, shall revenge, get rid of him, dislike him

Score 2: feel uncomfortable, feel sad, feel dull, get away from him, tell him to stop, feel upset, am worried, feel unhappy

Score 3: feel nothing, ask why

Score 4: remain polite to him, find out my weakness, request him not to do such thing to me, remain calm, be patient

Score 5: don't care, don't mind, forgive him, take it, forget it

6. When I am in a party, I .....

Score 1: like to sit in a corner, feel uneasy, feel uncomfortable, feel shy, just sit, feel lonely, do not know what to do, like to be quiet, feel sick, feel unhappy, am ashamed of myself, am not interested, feel like in a prison

Score 2: feel nothing, will not dance with strangers, feel dull

Score 3: am a guest

Score 4: feel happy, would enjoy myself, dance with my partner, enjoy it, try to be outstanding

Score 5: dance all the time, feel very happy, feel very excited, like to know as many people as possible, will make new friends

7. When a stranger sits beside me, I .....

Score 1: feel uncomfortable, feel shy, feel nervous, shall go away, am afraid, feel angry, feel sad, feel ashamed, feel strange, feel trouble, look strangely at him, take no notice of him, feel suspicious, ignore him, feel unsafe, keep silent, take care of my pocket, pay no attention to him, observe him carefully

Score 2: do not care, feel nothing, will not bother him, do not know what to do

Score 3: do not mind

Score 4: will talk to him, try to know him, feel excited, feel interested in him

Score 5: would like to know more about him, want to make friend with him

8. When people look at me, I feel .....

Score 1: uncomfortable, shy, very embarrassed, ashamed, upset, something wrong, trouble, afraid, my face changing red, terrible, bad, angry

Score 2: unnatural, something would happen, very dull, funny, strange, sad, unhappy

Score 3: nothing, different at different times

Score 4: don't care, that I am attractive, don't mind, natural, interesting, surprised

Score 5: very happy, wonderful, very proud, exciting

9. When I am neglected, I feel .....

Score 1: interesting, very comfortable, angry, trouble, ashamed, happy, pleasant, free

Score 2: unreasonable, dull, sorry

Score 3: nothing, common

Score 4: that I have done something wrong, sad, lonely, unwanted, empty, lost, upset, blue, unhappy, afraid

Score 5: very unhappy, very uncomfortable, very terrible, bad, a failure, miserable, hurt, guilty, I have neglected them too, very sad, a fool, disappointed, hopeless

10. When somebody is unkind to me, I .....

Score 1: hate him, shall be unkind to him too, never talk to him, will not be his friend any more, go away, shall take revenge, leave him, will not play with him, avoid him, do not care, do not like him, quarrel with him, stay away from him

Score 2: feel angry, feel unhappy, feel very bad, feel very upset, feel dull

Score 3: say nothing, feel he is uneducated, feel nothing

Score 4: do not mind, let him go, will not scold him, deal with him carefully

Score 5: forgive him, shall still be his friend, shall still be kind to him

11. If I do not agree with my friends, I .....

Score 1: go away, think they are wrong, leave them, hate them, argue with them, am angry, shall protest, don't like them, quarrel with them, hate them, don't care about them, don't talk to them, avoid them, won't see them again, will do in my own way

Score 2: feel bad, feel unhappy, feel upset, feel dull, feel uncomfortable, feel annoyed, feel right, feel sorry, feel sorrowful

Score 3: say nothing, feel nothing, keep silent, take no action, do nothing

Score 4: explain my point, think I might be wrong, don't mind, won't argue, tell them why, give my reasons, try to prove I am right

Score 5: discuss with them, persuade them

12. If someone bothers me when I am busy, I .....

Score 1: feel it is a trouble, curse him, am very angry, will kick him out, hate him, lose my temper, scold him, damn him, quarrel with him, curse him, continue to do my work, feel annoyed, ignore him

Score 2: don't like to make friend with him, feel unhappy, tell him to go away, go away, neglect him

Score 3: ask him to wait, ask him not to bother me, won't talk to him

Score 4: don't care, ask why, don't mind

Score 5: shall be patient, will still help him, still spend time with him

13. When my friends leave me, I feel .....

Score 1: comfortable, happy, some enemies less

Score 2: angry

Score 3: nothing

Score 4: lonely, sad, unhappy, uncomfortable, sorry, worried, blue, alone, anxious

Score 5: very lonely, very dull, something lost, upset, disheartened, miserable

14. If my friend gets angry with me, I .....

Score 1: hate him, don't want to explain, am angry with him, ignore him, walk out, stay away from him, feel annoyed, don't care, will not talk to him, curse him, shall not forgive him, end my friendship with him, scold him

Score 2: do nothing, say nothing to him, feel nothing

Score 3: feel something wrong, feel afraid

Score 4: feel very bad, feel sorry, feel very sad, will be unhappy, feel upset, shall find out why, feel uncomfortable

Score 5: make up with him, apologize to him, forgive him, try to make him happy, beg him to forgive me, will pacify him, try to explain my point

15. If my classmates laugh at me, I .....

Score 1: keep in mind, feel very angry, hate them, ignore them, scold them, feel my face going red, feel sorry, shall revenge, shall lose my temper, do not talk

Score 2: laugh at them too, feel sad, feel shy, feel uncomfortable, feel unhappy, feel I have done wrong, feel shame

Score 3: feel nothing

Score 4: try to find out the reason, just smile, take it light, won't be angry

Score 5: laugh with them, don't care, don't mind, forgive them

16. When I am invited to a party, I feel .....

Score 1: very sad, uncomfortable, very afraid, it is a waste of time, very dull, uneasy, nervous, lonely, troublesome, shy, terrible

Score 2: nothing

Score 3: like a guest, usual, neither happy nor unhappy

Score 4: happy, excited

Score 5: very proud, very happy, it is an honour

17. Talking to friends is .....

Score 1: not suitable for me, very difficult, not easy, a waste of time, terrible

Score 2: dull

Score 3: better than writing a letter, common, normal

Score 4: good for me, a good pastime, a happy feeling, enjoyable, quite useful, comfortable, a way to learn, my habit

Score 5: the best way to learn, a happy time, very good, a pleasure, very interesting, necessary, valuable, wonderful, very splendid

18. Studying with friends is .....

Score 1: not good, useless, very dull, a waste of time, troublesome, not necessary

Score 2: very funny, nothing

Score 3: not bad, my habit, a way to exchange information, normal

Score 4: good, happy, useful, a good way to learn, quite nice, a good way to improve, safe, interesting

Score 5: very interesting, better than studying alone, very helpful, very good, my greatest pleasure, best method of study, necessary

19. Friendship to me is .....

Score 1: rubbish, of no value, artificial

Score 2: not very important

Score 3: something which is uncertain

Score 4: important, useful, needed, helpful

Score 5: very important, best, valuable, necessary, essential, precious, splendid, better than anything in the world

20. Writing letters to friends is .....

Score 1: quite difficult, a waste of time, a waste of money, not important, terrible, no good for me, nonsense, troublesome, not my habit

Score 2: dull, not often

Score 3: my hobby, a mutual thing, a type of communication, to keep in touch, common

Score 4: quite easy, a good habit, useful, interesting

Score 5: very easy, very happy, important, necessary, to promote friendship, a pleasure, wonderful

SENTENCE COMPLETION MARKING SCHEME

Academic Motivation

1. Getting good marks in school is .....

Score 1: not important, not a proud thing, not meant good in other things, nothing, good for someone but not good for me, impossible

Score 2: not a very happy thing for me

Score 3: meant better ability than others, meant hard work, neither good nor bad, a result of hard work, difficult

Score 4: good, my own duty, comforting, my wish, my hope, a happy thing, satisfying, rather nice, wonderful, an honour, a proud thing, what I like, a good matter, my plan, quite a happy matter, a pleasure for me, a good thing for everybody, quite pleasant, splendid

Score 5: very good, a very happy thing, excellent, best, very pleasing, a very proud thing, a happiest moment, very important, my aim, a pleasure, a great honour, a great interest for me, of great value, the happiest thing in the world, very nice, the happiest thing in my life, best for me

2. If I am late for school, I feel .....

Score 1: nothing, natural, not a serious thing, famous, very common

Score 2: quite interesting, exciting, rather wonderful, eager

Score 3: dull

Score 4: unhappy, ashamed, lost, shy, sorry, afraid, sad, rather sad, guilty, quite ashamed, frightened, quite uncomfortable, rather ashamed, upset, rather shy, uncomfortable, not satisfied, trouble, bad, annoyed, angry, anxious, have been lazy

Score 5: very sad, very afraid, very sorry, very unhappy, very unlucky, very ashamed, very frightened, very uncomfortable, very shy, very upset, a failure

3. Prizes and scholarships are .....

Score 1: hard to get, not necessary, dull, very difficult to get, a waste, hard for me, for poor students, not good, not for me, useless, vain glory, never for me, not good for me, not the things I need

Score 2: not quite important, good for students with exceptional ability, quite good for some students, for the famous students only

Score 3: names, rewards, expensive

Score 4: making me happy, good, what I want to get, also important for me, precious to student, good, valuable, honours, compliments, helpful, nice, necessary, signs of good knowledge, good things, useful for us, good to get, needed for myself, helpful in my study, liked by me, hoped for by everybody, wonderful, signs of success, interesting for me

Score 5: the best things, useful to encourage students, good for every student, very useful, very good for hard working students, very important, very good, what I am hoping for, admired by me, encouragement for us, very helpful, good honours and reputation, very wonderful, excellent, necessary in school, making me work faithfully, aimed at by me, necessary for getting good results

4. I think teachers are .....

Score 1: those who are just older than I, unable to understand students, not as good as I thought, wood blocks, inconsistent, not good, cowards, evil, instruments in school, teaching machines, very dull, cruel, all inexperienced, too severe

Score 2: just ordinary people, common people, not all good, normal people

Score 3: human beings, not animals, good and bad

Score 4: important for me, kind, good, nice, educated, good for students, humble, hard-working, know more than I, having responsibility, behaving well, friends, pleasant, pure, teaching me knowledge, leaders for us, people who can help me solve problems, our guides, clever, fair, admirable, responsible for educating us, helpful, useful, straight

Score 5: very knowledgeable, very kind, our models, very powerful, very interesting, very necessary, good advisers for students, trying their best to teach us, good for our future, great, very helpful, best friends, well-educated, best, respectful, very good in memory, defending truth, as good as our parents, always very straight, respected by students, very patient

5. My future plan is .....

Score 1: to work in office, to travel, to be a singer, to be a worker, to be a sailor, to work in the airport, to join police, to be a clerk, to be a fireman, to be an artist, to be in the army, to become a football player, to be a contractor

Score 2: to be a factory manager, to be a secretary, to be a reporter, to be a mechanic, to be an editor, to be an officer

Score 3: to work for people, to do my best, not certain, to work for the public, a good citizen, to get a good job, to be rich, to leave school

Score 4: to be a teacher, to be an engineer, to join air force, to be a nurse, to be a detective, to be an accountant, to be a pilot, to be a merchant, to be a social worker in government

Score 5: to study more, to be a doctor, to study for ever, to be a famous person, to be a judge, to complete higher education, to be a highly educated person, to be a philosopher, to be a politician, to study abroad, to be an economist, to be a lawyer, to study at the university, to study as much as I can, to continue my study

6. School life is .....

Score 1: very dull, not good, not interesting, not happy, not important

Score 2: not bad, not dull, quiet, not easy

Score 3: sometimes interesting but sometimes monotonous, moderate

Score 4: wonderful, happy, exciting, quite good for me, interesting, valuable, good, training for the future, quite nice, free, sweet, pure, beautiful, enjoyable, bright, an organised life, as good as home life, a good time for me, colourful

Score 5: very happy, very good, very wonderful, very important, very interesting, full of happiness, one of the happiest things in the world, unforgettable, best time in our life, very active, meaningful, like heaven, fantastic

7. If I do not succeed in my first attempt, I .....

Score 1: will give up, feel unlucky, feel angry, will not try any more, lose my interest

Score 2: feel very disappointing, feel ashamed, will cry, feel sad, feel unhappy, feel sorry, feel hopeless, feel upset

Score 3: feel nothing

Score 4: will work hard in the second attempt, will try again, am not discouraged, feel I could do better next time, will try my best next time

Score 5: will attempt again and again until I succeed, will go on trying

8. Success in school is .....

Score 1: not to be proud of, not very important, not very good, hard, a failure in society, not useful, useless, a surprise to me, not an honour, not my aim

Score 2: too easy, reasonable, not a bad thing, not enough, very lucky, not a proof that one will succeed in future, difficult, usual

Score 3: useful for finding jobs, not the same as success in future

Score 4: important, satisfying, cheerful, good for me, happy, good future, great, an honour, nice, a good beginning in life, part of the success in life, splendid, a success in life, better than other things, what I want, a comfort to me and my parents, a necessary thing we need

Score 5: a very happy thing for me, the best thing I want, very important for me, a proud thing, very encouraging, a glory, very wonderful, a great pleasure, the best thing in life, what we should aim at, very helpful in future

9. Most things I learn in school are .....

Score 1: how to behave, not practical in society, just waste to my future, not enough, useless in life, not very important, not necessary in society, difficult, not helpful, easy, how to be a good person, how to live with other people, rather dull, not interesting

Score 2: how to study hard, very common

Score 3: general knowledge, new, not so bad, necessary, easy

Score 4: useful, interesting, valuable, exciting, helpful, suitable, quite important

Score 5: very useful for me in future, very important, basic for future success, wonderful

10. I am interested in .....

Score 1: games, picnic, scouting, dancing, musical records, sports, singing, dreaming, drawing, swimming, art, taking photos, collecting stamps

Score 2: story books, helping others, typing, watching T.V., engines, youth activities, going to cinema

Score 3: everything

Score 4: (any school subjects)

Score 5: studying, learning, reading reference books, thinking

11. My aim in life is .....

Score 1: to earn money, to be a good child at home, to be rich, to enjoy myself, to have a good time, to have a comfortable time, to live, to be happy, to love, nothing, to be healthy

Score 2: to help others, to work hard, to serve others, to work for everyone, to have experience of the world

Score 3: to do more things, to understand life, to be a good person, to be good in everything, to do my best, to succeed, to be a good citizen, to achieve

Score 4: to study hard to please my parents, to get a good name in society, to be a merchant, to be a teacher, to be a successful person, to be meaningful, to be a manager, to be an economist

Score 5: to study all the time, to be famous, to be a doctor, to study until death, to continue studying, to have higher education, to learn, to have a good education, to study in the university

12. I think university education is .....

Score 1: not very good, very difficult, unnecessary, not important, not suitable for me, a waste of time, not for me, not an honour, useless

Score 2: difficult, common only in rich countries, social life, for the privileged few, easy

Score 3: higher education, a place of study, for future requirements, not clear to me, quite free

Score 4: necessary, good, wonderful, high, better than secondary, nice, useful for finding jobs, quite useful, important, essential, valuable, good training

Score 5: highest, very good, very nice, of very high level, very much needed, very useful, a way to become great, very wonderful, suitable, for everybody, necessary for a good living, excellent, very important, more interesting than secondary, a good way to success, best, just a beginning of one's life, a good education, my hope

13. As soon as I finish school, I .....

Score 1: shall work in society, shall start to look for work, shall find a job, do nothing, shall go out to work, don't know what to do, play with others, listen to music, shall earn my own living, am happy, shall make a profit, feel very happy, feel good, shall get married, feel satisfied

Score 2: feel relaxed, wish to become a teacher, feel comfortable, feel free, finish my education

Score 3: think of the future, don't feel anything, feel both happy and unhappy, go home, leave school, leave home

Score 4: want to learn other things, study other things, feel something lost, feel sad

Score 5: shall further my study, shall enter university, shall go on studying, go abroad to study, shall continue my education, shall get a higher education, want to study more

14. If my examination results are not good this time, I .....

Score 1: don't mind, don't feel surprised, give up, feel nothing, would do nothing

Score 2: feel very sorry, feel very sad, feel unhappy, feel shy, feel disappointing, feel upset, feel very bad, shall punish myself, feel ashamed, surprised

Score 3: shall pass next time, hope to do better next time

Score 4: would work hard, shall be more diligent, shall make a better plan for study

Score 5: try my best next time, keep on trying

15. I study for .....

Score 1: making money, earning more money

Score 2: my own good

Score 3: nothing, (so many years), no purpose, self-satisfaction, myself

Score 4: more knowledge, (any subjects)

Score 5: my ambition, my future, my interest, my career

16. If I could not finish my homework in time, I .....

Score 1: will not hand in, don't mind, leave it, tell a lie, give up, go to bed as usual, find an excuse, don't care, do nothing

Score 2: feel nothing, ask someone to help, copy from my classmates

Score 3: shall finish it tomorrow, finish it next time, do as much as I can, explain to my teacher, shall do it in school

Score 4: feel unhappy, feel shy, feel uncomfortable, feel upset, feel sad, feel terrible, feel sorry, feel worried, feel wrong, feel guilty, blame myself, feel frightened

Score 5: shall continue until I finish, continue very late at night, will not sleep

17. To do better than others is .....

Score 1: not easy, quite difficult, not for me, useless

Score 2: not good, very easy

Score 3: to work hard, a proof of better ability, more successful

Score 4: my wish, what I hope, my duty, good, necessary, very good, happy thing

Score 5: outstanding, my aim, an honour, the best thing, a glory, very important, a proud thing, wonderful, splendid, my ambition

18. When there is some difficult work, I .....

Score 1: feel unable to do it, try to avoid it, give it up, might cry, leave it, don't like it

Score 2: fear that I cannot do it, feel uncomfortable, feel very sorry, do it later, feel rather unhappy, feel worried

Score 3: don't mind

Score 4: think about it, would be more careful, ask my teacher, want some help, shall attempt it, would try to solve

Score 5: shall try my best, feel more challenging, shall be happy to do it, must do it, continue to do it until I solve the problem, spend more time on it, impatient to do it

19. After I have done my homework, I .....

Score 1: go to play, watch T.V., listen to records, feel nothing, help my parents, shall relax, enjoy myself, sleep

Score 2: feel happy, feel comfortable, feel free, feel nice, pleasure, feel relaxed

Score 3: feel I have fulfilled my duty, feel satisfied

Score 4: discuss with my classmates, check again

Score 5: read other books, study reference books

20. Studying hard is .....

Score 1: not useful, not necessary, not easy, dull, useless, foolish, harmful to health, tiring, stupid, nonsense, never for me, not good, not valuable

Score 2: easy, happy, difficult

Score 3: what the teachers always say, human, good for examination

Score 4: good for us, my duty, to obtain good results, a good habit, necessary, what we should do, a kind of enjoyment

Score 5: very good, best, essential to success, very important, very useful, helpful, very nice, my aim, main factor for success

Appendix 9. COMPOSITION MARKING SCHEME

My Family Life

The following are five "score 1" answers:

I feel my family life is very dull. Everyday when I go home after school, I read newspaper. After that I take a bath and have dinner. I start my homework at about half past six. When I finish my homework, I read some reference books and watch television. There are seven people in my family, and I am the youngest. My father and myself are the only male members of the family. Sometimes I feel very lonely at home, therefore I go camping during holidays. Also, I go to the cinema with some of my classmates on weekends.

I have a sister and two brothers. My parents are very strict to us especially with our school work. My sister has finished school, and is now working. My two brothers are very naughty. They always fight with each other. Sometimes they even disturb my work and make me very angry. My father works in an office. Every evening he teaches my youngest brother, and sometimes he chats with our neighbours. He is easily irritated. My brothers are often scolded by him.

My family consists of my father, mother, two younger sisters, and myself. My father has been out of work for many years. My mother works to earn money. My sisters and I study in a secondary school. We cook supper everyday. We have to clean our home and wash clothes. We seldom have outdoor activities. Now I have a great problem. I find it difficult to do my homework at home. I cannot concentrate, since there are so many things worrying me at home. I don't much like studying at home, and so my school results get worse as time goes on.

Everyday I go to school in the early morning and come home in the afternoon. There is no other teenager than myself at home: I feel very dull. After doing a little homework, I do other things. I seldom talk to the other members of the family. At night the house is as noisy as a market. The television set is switched on for the whole evening till midnight. I would rather stay in school than at home.

I feel that my home is like a prison. If I am at home, I just do my homework. I feel it is not a happy place. My mother is an unjust woman. She always punishes me without reason. I am the eldest son in the family. I have one sister and two brothers. My parents go to work during the day and come back at night. My father hates my mother's unreasonable demands. I feel that talking to my parents is meaningless.

Note: The underlined key words indicate the students' very unfavourable attitude to home.

The following are five "score 2" answers:

I have three brothers and two sisters. At home we sometimes quarrel with one another, but this does not last long. After we finish our homework, we sit together and watch television. My father always checks whether we study or not. I am the youngest child in the family. In my parents' mind, I am always a small child. During the holidays, our parents go to have a picnic with us. I am not quite satisfied with my family life.

Sometimes, I feel my family life is dull. Everyday, when I come home after school, I have my lunch first. After lunch, I sleep for about an hour, then I start to do my homework. At about seven o'clock, I have my dinner. After dinner, I wash the plates and have a bath. Then I sit on the sofa, and read the newspaper. At about nine o'clock, I switch on the televison, and watch for a while. At about ten o'clock, I start to prepare lessons for tomorrow, or read a few reference books. At about eleven o'clock, I go to bed.

My family consists of eight persons including my parents, a sister and four brothers. All of us have our work to do. As I grow older, I feel that things at home do not interest me. Everyday I go back home from school, do my homework, read newspaper, watch television programmes and study my books. No one at home talks to me. I am unhappy and lonely in my family, and I feel that my family life is dull.

Everyday I return home from school at two o'clock. After lunch, I sleep for about an hour. When I wake up, I turn on the radio. I read newspapers or magazines more than my books. At about seven, I have my dinner. After that, I do my homework and then watch television. My parents scold me sometimes because I am not interested in my studies. I can never concentrate at home because of the various noises. I do not think that home is the place for me.

In the morning my mother wakes me up to have breakfast. When I finish school, I go home. I sometimes do homework. In general I think home life is dull. This is the reason why I think that home is not quite suitable for me. I have nothing interesting to do at home: I just help my mother to do the housework, prepare the meals, wash clothes, and clean windows.

Note: The underlined key words indicate the students' unfavourable attitude to home.

The following are five "score 3" answers:

Every-one in the family has his or her own duty to do. After lunch,we have a rest before doing our work. Our mother does handicraft for a factory, while we do our homework. When we finish our homework, we help our mother to finish her handicraft so that she can return it to the factory on time. She buys food from the market, and we help her prepare our meal. In the evening, we gather together to have our supper. After meal, we study our subjects again and get things ready for the next day.

There is nothing unusual in my family. My father and mother go out all day to work in order to support the family. My brother and sister study hard and have good school reports. There are not many opportunities for the family to be together. My father is good in telling us his view of life, but we are tired of hearing it so many times over. Both parents are reasonable to us.

In the morning, members of the family get ready to go to work, while I carry my bag and go to school. School finishes at about half past one. I stay in school for a while and go home at about two. I always visit my neighbours in the afternoon. Sometimes after school I go to see a movie with some of my schoolmates. After that, I go home. In the evening, I usually watch television. At about nine, I begin to do my homework and study till midnight.

My family life is not unusual. After school, when I finish my homework, I help my mother do all the housework. Then members of the family sit around to talk about things of the day. Sometimes my father tells me horrible ghost stories. During holidays, we sometimes have a picnic to the countryside or to the beach.

My father is a retired taxi driver. I have two brothers and three sisters. Two of my eldest sisters are now overseas: one is in Boston and the other in Holland. My eldest brother is a seaman; he comes home twice a month. My elder brother is a waiter in a hotel. One other sister is a clerk in a company. I am the smallest in the family. All my brothers and sisters are working, and I am the only one still in school. My mother is a housewife.

Note: The above answers do not show marked feelings towards home.

The following are five "score 4" answers:

I think my family life is a happy one. Everyday I go to school after breakfast. My father goes out to work. My mother stays at home to do housework. I finish my homework usually before dinner. After dinner all the members of the family have a cold drink, and talk together about something which we have met during that day. If I have some problems, my parents try their best to solve them for me. Sometimes my father teaches us how to behave ourselves and he discusses with us about our future plans.

There are six members in my family: my parents, my brother and two elder sisters. My father goes to office everyday. My brother does not live with us, and he works in the other side of the harbour. My sisters are married. My mother usually stays at home to do housework. She loves me. Everyday she prepares lunch for me in time. When she has spare time, she makes dresses for me. When my father comes home from his office, it is about seven o'clock, and we have dinner together. After dinner, we sit together and chat. Sometimes, my father tells us something about his work. When there is a festival, we celebrate together. I feel that home is a nice place for me.

My family consists of father, mother, two brothers and one sister. Everyday, when I finish my homework, I usually watch television or read story books and newspaper. I go to bed at about eleven o'clock. I find that my family life is quite happy. When my father and brothers come home, I feel my home is a lovely and sweet place.

My family life is happy and peaceful. I live with my father, mother, nine brothers, and five sisters. My father and mother love all of us. Sometimes my father goes to see his friends with some of us. My mother never goes out alone. My sisters and brothers often help our mother do housework. I feel safe at home.

I have a happy family of nine people. My father is a merchant, working in his factory. My mother is a kind woman. She takes care of the family and does all the things such as cooking, washing, etc. She is a hard-working woman. I have two elder sisters and brothers and two younger brothers. Whenever we are all together, we have a nice party, chatting happily together, watching television, or listening to records. All the time home life is enjoyable. The whole family go out for a picnic together every Sunday. I always play chess with my two younger sisters when all of us have done our homework. Home is pleasant for me.

Note: The underlined key words indicate the students' favourable attitude to home.

The following are five "score 5" answers:

My family life is the happiest. I have a grandmother, mother, six sisters, and brothers. Everyday, all except my grandmother go to school or to work. After school, I go home at once to do my homework. Then I watch television for one or two hours before dinner. Dinner time is the most comfortable hour of the day: we sit together and talk about what happen during the day. Moreover, our home is full of joy and love. Every Sunday, we usually go shopping.

I have a very happy family. Our parents are very kind to us. They want us to have a good education. My father works in an office, and my mother stays at home to do housework. My mother does not want us to help with her housework, because she wants us to concentrate on our homework. In the evening, all of us gather around talking and playing with our parents. During holidays, we have picnics or go to the cinema to enjoy ourselves. Therefore our family is always full of happiness.

I live with my parents, brothers and sisters. My mother looks after the family, while my father goes out to work. We live together harmoniously, though we sometimes disagree with one another over some problems. But, we always solve our problems at the end, and are friendly with one another again. On the whole, my family is full of love and happiness.

My family life is very happy. After supper, we always sit together to talk or listen to music to relax ourselves. We live happily together. My parents are very kind to us. I always study with my brothers and do homework together. In the holidays, the whole family go to picnic, go to swim, or go to the cinema to see a picture. All in all my family life is very enjoyable: we work together, study together, and play together.

My family life is very happy. It is much better than school life. I have father, mother, one brother, and three sisters. My elder sister is three years older than I. She is a nurse. She lives in quarters and does not return home everyday. My mother is a very kind woman. She loves all of us very much, and gives us a lot of help. After school, I go home immediately, take a rest, finish my homework, and then help mother do some housework. I enjoy my family life very much.

Note: The underlined key words indicate the students' very favourable attitude to home.

(c) Academic Results of School Sample

Appendix 10. English, Science, Mathematics and Overall Results of Fourteen Schools

School	English Subjects				Science Subjects (Biol. Chem. Phys.)				Math. Subjects				Overall Results			
	1968	1969	1970	Av.	1968	1969	1970	Av.	1968	1969	1970	Av.	1968	1969	1970	Av.
1	87.42	91.82	94.37	91.20	84.67 80.00 87.39	86.49 92.97 82.68	87.32 95.76 93.22	87.83	87.07	87.22	94.92	89.74	84.93	90.46	90.78	88.72
2	67.57	76.47	83.60	75.88	-- 66.67 74.32	-- 65.57 73.53	-- 66.10 90.16	72.73	90.54	98.53	96.72	95.26	81.83	86.92	86.56	85.10
3	100	100	100	100	94.62 68.09 80.65	88.18 89.09 94.74	90.29 88.37 87.09	86.79	83.72	97.83	84.00	88.55	87.39	89.09	90.16	88.88
4	98.21	98.31	92.00	96.17	65.71 95.59 82.19	82.76 100 96.87	93.33 79.24 74.41	85.57	85.15	79.44	70.83	78.47	84.64	86.18	83.51	84.78
5	90.91	94.56	87.41	90.96	71.21 36.84 86.59	80.99 89.83 82.24	78.78 70.45 71.53	74.27	94.85	97.04	85.00	92.30	83.83	88.11	76.51	82.82
6	--	14.29	28.94	21.62	-- -- --	0 0 --	35.29 50.00 33.33	23.72	--	15.00	41.66	28.33	--	17.30	33.46	25.38
7	33.33	43.94	20.27	32.51	21.74 29.41 25.00	36.54 72.00 39.13	15.78 42.30 28.12	34.45	50.00	63.33	66.66	60.00	42.79	48.14	33.20	41.38

App. 10. English, Science, Mathematics and Overall Results of Fourteen Schools (cont'd.)

School	English Subjects				Science Subjects (Biol. Chem. Phys.)				Math. Subjects				Overall Results			
	1968	1969	1970	Av.	1968	1969	1970	Av.	1968	1969	1970	Av.	1968	1969	1970	Av.
8	86.76	68.00	69.23	74.66	71.15 88.37 82.35	55.88 79.55 52.00	54.02 77.77 57.77	68.82	86.36	65.52	55.22	69.03	78.72	70.89	68.25	72.62
9	23.44	22.35	20.93	22.24	3.57 17.65 38.46	17.39 40.00 27.27	9.72 22.22 18.51	21.69	34.48	46.67	25.80	35.65	26.16	28.37	22.53	25.69
10	20.00	13.33	40.00	24.44	26.19 44.00 11.11	25.00 25.00 23.53	52.63 54.16 36.84	33.16	42.86	61.54	59.52	54.64	43.06	45.00	62.69	50.25
11	63.24	57.83	77.38	66.15	54.84 60.94 58.95	58.82 87.50 73.17	60.00 72.05 56.52	64.75	77.61	70.73	69.62	72.65	70.68	75.77	74.95	73.80
12	47.73	54.12	55.17	52.34	45.95 77.78 51.28	52.63 82.22 58.97	73.91 77.63 60.00	64.44	77.94	63.51	67.36	69.60	64.44	64.81	65.15	64.80
13	11.63	13.95	22.13	15.90	31.09 43.40 38.16	35.29 24.53 26.39	43.33 20.00 21.97	31.57	33.01	38.14	39.79	36.98	32.81	31.21	41.51	35.18
14	--	59.46	52.77	56.11	-- -- --	38.71 45.45 27.27	45.45 50.00 75.00	46.98	--	63.64	58.33	60.99	--	63.76	48.19	55.98

'Father Concerned'

45.000	)
43.500	)
42.000	)*********19
40.500	)*********17
39.000	)*********95
37.500	)*********55
36.000	)********180
34.500	)********104
33.000	)********191
31.500	)**********97
30.000	)********153
28.500	)*********75
27.000	)********128
25.500	)**********44
24.000	)********115
22.500	)*********21
21.000	)*********40
19.500	)**********15
18.000	)*********23
16.500	)*******
15.000	)******
13.500	)********
12.000	)**********
10.500	)*
9.000	)**
7.500	)
6.000	)**
4.500	)
3.000	)
1.500	)

MEAN 31.183
S DEV 6.036
N 1408.

'Father Restricted'

22.500	)
21.750	)
21.000	)*********20
20.250	)
19.500	)*********17
18.750	)**********29
18.000	)*********67
17.250	)
16.500	)**********66
15.750	)**********96
15.000	)********135
14.250	)
13.500	)********165
12.750	)********139
12.000	)********181
11.250	)
10.500	)********136
9.750	)********129
9.000	)********103
8.250	)
7.500	)**********46
6.750	)***********36
6.000	)*********26
5.250	)
4.500	)*********11
3.750	)***
3.000	)***
2.250	)
1.500	)
0.750	)

MEAN 12.822
S DEV 3.363
N 1408.

'Mother Concerned'

51.000	)
49.500	)
48.000	)**********19
46.500	)**********12
45.000	)**********55
43.500	)**********45
42.000	)**********90
40.500	)**********52
39.000	)********135
37.500	)**********74
36.000	)********177
34.500	)**********69
33.000	)********151
31.500	)**********68
30.000	)********128
28.500	)**********56
27.000	)********141
25.500	)**********32
24.000	)**********36
22.500	)**********12
21.000	)**********21
19.500	)**********
18.000	)**********11
16.500	)****
15.000	)*********
13.500	)**
12.000	)
10.500	)*
9.000	)
7.500	)

MEAN 34.532
S DEV 6.648
N 1408.

'Mother Restricted'

22.500	)
21.750	)
21.000	)**********25
20.250	)
19.500	)**********34
18.750	)**********49
18.000	)**********90
17.250	)
16.500	)**********74
15.750	)********114
15.000	)********169
14.250	)
13.500	)********144
12.750	)********153
12.000	)**********208
11.250	)
10.500	)**********139
9.750	)**********89
9.000	)**********68
8.250	)
7.500	)**********39
6.750	)**********19
6.000	)********
5.250	)
4.500	)********
3.750	)***
3.000	)**
2.250	)
1.500	)
0.750	)

MEAN 13.580
S DEV 3.293
N 1408.

'Father Democratic'

```
 62.000 )
 60.000 )
 58.000 )
 56.000 )*
 54.000 )*
 52.000 )***
 50.000 )**********14
 48.000 )**********22
 46.000 )**********43
 44.000 )***********68
 42.000 )*********115
 40.000 )*********136
 38.000 )*********145
 36.000 )*********146
 34.000 )*********149
 32.000 )*********175
 30.000 )*********115
 28.000 )**********85
 26.000 )**********52
 24.000 )**********43
 22.000 )**********33
 20.000 )**********22
 18.000 )**********14
 16.000 )*********
 14.000 )****
 12.000 )**
 10.000 )*
  8.000 )
  6.000 )
  4.000 )

MEAN       35.129
S DEV       7.056
 N       1408.
```

'Father Demanding'

```
 30.000 )
 29.000 )
 28.000 )*
 27.000 )***
 26.000 )**
 25.000 )******
 24.000 )**********15
 23.000 )**********18
 22.000 )**********35
 21.000 )**********42
 20.000 )**********67
 19.000 )*********1 4
 18.000 )**********99
 17.000 )**********134
 16.000 )*********220
 15.000 )*********138
 14.000 )*********144
 13.000 )**********99
 12.000 )**********94
 11.000 )**********68
 10.000 )**********49
  9.000 )**********33
  8.000 )**********13
  7.000 )**********
  6.000 )***
  5.000 )*
  4.000 )**********
  3.000 )
  2.000 )
  1.000 )

MEAN       15.558
S DEV       3.704
 N       1408.
```

'Mother Democratic'

```
 45.000 )
 43.500 )
 42.000 )*********19
 40.500 )*********23
 39.000 )*********44
 37.500 )*********36
 36.000 )*********97
 34.500 )*********63
 33.000 )*********157
 31.500 )**********89
 30.000 )*********160
 28.500 )**********60
 27.000 )*********135
 25.500 )**********83
 24.000 )*********168
 22.500 )**********49
 21.000 )**********65
 19.500 )**********21
 18.000 )**********44
 16.500 )**********18
 15.000 )**********20
 13.500 )**********17
 12.000 )**********14
 10.500 )***
  9.000 )******
  7.500 )**
  6.000 )*****
  4.500 )
  3.000 )
  1.500 )

MEAN       28.653
S DEV       6.795
 N       1408.
```

'Mother Demanding'

```
 30.000 )
 29.000 )
 28.000 )*****
 27.000 )***
 26.000 )**********
 25.000 )*********18
 24.000 )**********23
 23.000 )**********35
 22.000 )**********46
 21.000 )**********69
 20.000 )**********81
 19.000 )*********126
 18.000 )*********111
 17.000 )*********146
 16.000 )*********209
 15.000 )*********122
 14.000 )*********102
 13.000 )**********83
 12.000 )**********75
 11.000 )**********46
 10.000 )**********36
  9.000 )**********27
  8.000 )**********16
  7.000 )*********11
  6.000 )**
  5.000 )****
  4.000 )**
  3.000 )
  2.000 )
  1.000 )

MEAN       16.462
S DEV       3.951
 N       1408.
```

'Father Autocratic'

```
40.500 )
39.000 )
37.500 )
36.000 )
34.500 )******
33.000 )******
31.500 )**********
30.000 )*********31
28.500 )*********29
27.000 )*********47
25.500 )*********59
24.000 )********127
22.500 )*********86
21.000 )********211
19.500 )********186
18.000 )********216
16.500 )*********85
15.000 )********131
13.500 )*********53
12.000 )*********55
10.500 )*********22
 9.000 )*********28
 7.500 )******
 6.000 )*********11
 4.500 )***
 3.000 )
 1.500 )
 0.0   )
-1.500 )
-3.000 )
```

MEAN 20.065
S DEV 5.011
N 1408.

'Father Rational'

```
45.000 )
43.500 )
42.000 )********
40.500 )******
39.000 )*********29
37.500 )**********18
36.000 )*********99
34.500 )*********56
33.000 )********163
31.500 )**********72
30.000 )********192
28.500 )*********97
27.000 )********177
25.500 )*********92
24.000 )********191
22.500 )*********38
21.000 )*********66
19.500 )*********30
18.000 )*********34
16.500 )*********12
15.000 )*********14
13.500 )****
12.000 )*****
10.500 )*
 9.000 )**
 7.500 )
 6.000 )**
 4.500 )
 3.000 )
 1.500 )
```

MEAN 28.695
S DEV 5.563
N 1408.

'Mother Rational'

```
45.000 )
43.500 )
42.000 )******
40.500 )**********
39.000 )*********32
37.500 )*********20
36.000 )**********65
34.500 )*********47
33.000 )********133
31.500 )*********68
30.000 )********191
28.500 )*********99
27.000 )********178
25.500 )********113
24.000 )********194
22.500 )*********59
21.000 )*********60
19.500 )**********35
18.000 )*********40
16.500 )*********12
15.000 )*********21
13.500 )******
12.000 )*********11
10.500 )****
 9.000 )***
 7.500 )
 6.000 )*
 4.500 )
 3.000 )
 1.500 )
```

MEAN 28.034
S DEV 5.725
N 1408.

'Mother Autocratic'

```
30.000 )
29.000 )
28.000 )**********
27.000 )*****
26.000 )**********
25.000 )*********23
24.000 )*********36
23.000 )*********40
22.000 )*********60
21.000 )*********71
20.000 )**********86
19.000 )*********75
18.000 )********105
17.000 )********114
16.000 )********169
15.000 )********120
14.000 )**********93
13.000 )**********68
12.000 )*********81
11.000 )*********58
10.000 )**********60
 9.000 )**********30
 8.000 )*********33
 7.000 )*********25
 6.000 )**********
 5.000 )*******
 4.000 )**********
 3.000 )
 2.000 )
 1.000 )
```

MEAN 16.165
S DEV 4.685
N 1408.

Verbal

```
30.000 )
29.000 )
28.000 )*****
27.000 )*******
26.000 )*********14
25.000 )*********
24.000 )*********13
23.000 )*********20
22.000 )*********43
21.000 )*********54
20.000 )*********65
19.000 )*********76
18.000 )*********82
17.000 )********121
16.000 )********111
15.000 )********108
14.000 )********116
13.000 )********106
12.000 )********118
11.000 )********111
10.000 )*********58
 9.000 )*********51
 8.000 )*********36
 7.000 )*********29
 6.000 )*********17
 5.000 )**********
 4.000 )*********
 3.000 )****
 2.000 )
 1.000 )
```

MEAN 14.940
S DEV 4.590
N 1393.

Numerical

```
36.000 )
34.500 )
33.000 )
31.500 )
30.000 )*
28.500 )**
27.000 )*********15
25.500 )*********13
24.000 )*********23
22.500 )*********19
21.000 )*********63
19.500 )*********52
18.000 )********130
16.500 )*********78
15.000 )********198
13.500 )********109
12.000 )********219
10.500 )*********61
 9.000 )********162
 7.500 )*********65
 6.000 )*********99
 4.500 )*********36
 3.000 )*********29
 1.500 )*********
 0.0   )**********
-1.500 )
-3.000 )
-4.500 )
-6.000 )
-7.500 )
```

MEAN 13.607
S DEV 5.343
N 1393.

Verbal+Numerical

```
60.000 )
58.000 )**
56.000 )*
54.000 )*****
52.000 )*********14
50.000 )********
48.000 )*********11
46.000 )*********18
44.000 )*********19
42.000 )*********37
40.000 )*********51
38.000 )*********54
36.000 )*********86
34.000 )*********97
32.000 )********102
30.000 )********107
28.000 )********121
26.000 )********115
24.000 )********122
22.000 )********114
20.000 )*********91
18.000 )*********58
16.000 )*********55
14.000 )*********44
12.000 )*********22
10.000 )*********18
 8.000 )*******
 6.000 )*********11
 4.000 )**
 2.000 )*
```

MEAN 28.505
S DEV 9.280
N 1393.

Non-Verbal

```
90.000 )
87.000 )**
84.000 )
81.000 )
78.000 )
75.000 )
72.000 )
69.000 )*
66.000 )
63.000 )*********47
60.000 )********167
57.000 )********184
54.000 )********131
51.000 )********138
48.000 )********142
45.000 )********129
42.000 )********126
39.000 )*********98
36.000 )*********78
33.000 )*********50
30.000 )*********35
27.000 )*********27
24.000 )*********18
21.000 )**********
18.000 )****
15.000 )*
12.000 )
 9.000 )*
 6.000 )****
 3.000 )
```

MEAN 48.787
S DEV 10.307
N 1393.

General Intelligence

```
124.000 )
120.000 )
116.000 )**
112.000 )*********13
108.000 )*********23
104.000 )*********43
100.000 )*********52
 96.000 )*********76
 92.000 )********108
 88.000 )*********96
 84.000 )********126
 80.000 )********130
 76.000 )********101
 72.000 )********111
 68.000 )********114
 64.000 )*********99
 60.000 )*********84
 56.000 )*********62
 52.000 )*********53
 48.000 )*********32
 44.000 )*********21
 40.000 )*********12
 36.000 )**********
 32.000 )*********13
 28.000 )****
 24.000 )***
 20.000 )
 16.000 )****
 12.000 )*
  8.000 )
```

MEAN	77.238
S DEV	17.506
N	1393.

Age

```
258.000 )*
255.000 )
252.000 )
249.000 )*
246.000 )****
243.000 )**
240.000 )******
237.000 )******
234.000 )*********12
231.000 )*********12
228.000 )*********15
225.000 )*********25
222.000 )*********52
219.000 )*********47
216.000 )*********59
213.000 )*********71
210.000 )*********95
207.000 )********172
204.000 )********124
201.000 )********108
198.000 )********149
195.000 )********127
192.000 )*********99
189.000 )*********71
186.000 )*********72
183.000 )*********54
180.000 )*********11
177.000 )*****
174.000 )******
171.000 )**
```

MEAN	204.061
S DEV	12.660
N	1408.

'Affiliation Attitude'

```
105.000 )
102.000 )
 99.000 )*
 96.000 )**
 93.000 )********
 90.000 )*********15
 87.000 )*********34
 84.000 )*********50
 81.000 )*********67
 78.000 )********136
 75.000 )********139
 72.000 )********150
 69.000 )********137
 66.000 )********153
 63.000 )********150
 60.000 )********102
 57.000 )*********83
 54.000 )*********55
 51.000 )**********44
 48.000 )*********25
 45.000 )*********25
 42.000 )*********
 39.000 )*******
 36.000 )*******
 33.000 )******
 30.000 )**
 27.000 )
 24.000 )*
 21.000 )
 18.000 )

MEAN      68.692
S DEV     11.054
N       1408.
```

'Frustration Attitude'

```
 55.500 )
 54.000 )**
 52.500 )*****.
 51.000 )*********14
 49.500 )*********17
 48.000 )*********39
 46.500 )*********46
 45.000 )********108
 43.500 )*********61
 42.000 )********158
 40.500 )********109
 39.000 )********190
 37.500 )*********69
 36.000 )********144
 34.500 )*********59
 33.000 )********168
 31.500 )*********39
 30.000 )*********61
 28.500 )**********30
 27.000 )**********30
 25.500 )*********16
 24.000 )*********19
 22.500 )****
 21.000 )**********
 19.500 )***
 18.000 )*
 16.500 )****
 15.000 )**
 13.500 )
-12.000 )

MEAN      38.364
S DEV      6.308
N       1408.
```

'Affiliation Interest'

```
 90.000 )
 88.000 )
 86.000 )**
 84.000 )*******
 82.000 )*********12
 80.000 )*********15
 78.000 )**********21
 76.000 )*********43
 74.000 )*********81
 72.000 )*********81
 70.000 )********147
 68.000 )********167
 66.000 )********177
 64.000 )********162
 62.000 )********126
 60.000 )********126
 58.000 )*********82
 56.000 )*********79
 54.000 )**********34
 52.000 )*********13
 50.000 )*********16
 48.000 )*********
 46.000 )*
 44.000 )***
 42.000 )*
 40.000 )*
 38.000 )*
 36.000 )*
 34.000 )
 32.000 )

MEAN      65.842
S DEV      6.843
N       1408.
```

'Individuality Interest'

```
 49.500 )
 48.000 )
 46.500 )
 45.000 )
 43.500 )
 42.000 )*****
 40.500 )**********
 39.000 )*********15
 37.500 )*********23
 36.000 )********126
 34.500 )********102
 33.000 )********255
 31.500 )********150
 30.000 )********275
 28.500 )*********93
 27.000 )********158
 25.500 )*********59
 24.000 )*********78
 22.500 )*********13
 21.000 )*********23
 19.500 )********
 18.000 )*********
 16.500 )****
 15.000 )***
 13.500 )
 12.000 )
 10.500 )
  9.000 )
  7.500 )
  6.000 )

MEAN      31.004
S DEV      4.185
N       1408.
```

'School Work'

```
55.500 )
54.000 )****
52.500 )******
51.000 )*********25
49.500 )*********17
48.000 )*********71
46.500 )*********44
45.000 )********120
43.500 )*********84
42.000 )********178
40.500 )********115
39.000 )********192
37.500 )*********86
36.000 )********140
34.500 )*********61
33.000 )********115
31.500 )*********29
30.000 )*********53
28.500 )*********15
27.000 )*********20
25.500 )******
24.000 )*********13
22.500 )***
21.000 )****
19.500 )**
18.000 )***
16.500 )
15.000 )*
13.500 )*
12.000 )
```

MEAN 39.659
S DEV 5.958
N 1408.

'Intrinsic Motives'

```
45.000 )*
44.000 )
43.000 )***
42.000 )*
41.000 )****
40.000 )********
39.000 )*********21
38.000 )*********18
37.000 )*********38
36.000 )*********70
35.000 )*********97
34.000 )********133
33.000 )********154
32.000 )********180
31.000 )********172
30.000 )********136
29.000 )********119
28.000 )*********93
27.000 )*********66
26.000 )*********30
25.000 )*********19
24.000 )*********
23.000 )*******
22.000 )*****
21.000 )**
20.000 )
19.000 )
18.000 )*
17.000 )
16.000 )*
```

MEAN 31.602
S DEV 3.406
N 1408.

'Incentive'

```
43.500 )
42.000 )
40.500 )
39.000 )
37.500 )
36.000 )
34.500 )**
33.000 )*********25
31.500 )*********23
30.000 )********=*98
28.500 )*********73
27.000 )********278
25.500 )********171
24.000 )********291
22.500 )********119
21.000 )********197
19.500 )*********61
18.000 )*********43
16.500 )*******
15.000 )*********12
13.500 )****
12.000 )**
10.500 )*
 9.000 )
 7.500 )
 6.000 )*
 4.500 )
 3.000 )
 1.500 )
 0.0   )
```

MEAN 25.092
S DEV 3.586
N 1408.

"Attitude to Home" (Sentence Completion)

```
 102.000 )
  99.000 )
  96.000 )
  93.000 )
  90.000 )***
  87.000 )*******
  84.000 )*********17
  81.000 )*********52
  78.000 )*********91
  75.000 )*********125
  72.000 )*********176
  69.000 )*********157
  66.000 )*********156
  63.000 )*********125
  60.000 )*********149
  57.000 )*********99
  54.000 )*********65
  51.000 )*********62
  48.000 )*********27
  45.000 )*********38
  42.000 )*********16
  39.000 )*********19
  36.000 )**********
  33.000 )**********
  30.000 )**
  27.000 )*
  24.000 )*
  21.000 )
  18.000 )
  15.000 )
```

MEAN 65.710
S DEV 10.706
N 1408.

"Social Interest" (Sentence Completion)

```
  74.000 )
  72.000 )
  70.000 )
  68.000 )*
  66.000 )*
  64.000 )
  62.000 )*********12
  60.000 )*********27
  58.000 )*********54
  56.000 )*********105
  54.000 )*********118
  52.000 )*********145
  50.000 )*********145
  48.000 )*********177
  46.000 )*********166
  44.000 )*********164
  42.000 )*********104
  40.000 )*********65
  38.000 )*********47
  36.000 )*********32
  34.000 )*********17
  32.000 )*********20
  30.000 )******
  28.000 )*
  26.000 )
  24.000 )
  22.000 )*
  20.000 )
  18.000 )
  16.000 )
```

MEAN 48.352
S DEV 6.287
N 1408.

"Academic Motivation" (Sentence Completion)

```
  86.000 )
  84.000 )
  82.000 )
  80.000 )***
  78.000 )*****
  76.000 )*********15
  74.000 )*********35
  72.000 )*********61
  70.000 )*********105
  68.000 )*********95
  66.000 )*********133
  64.000 )*********140
  62.000 )*********154
  60.000 )*********140
  58.000 )*********117
  56.000 )*********87
  54.000 )*********107
  52.000 )*********64
  50.000 )*********47
  48.000 )*********36
  46.000 )*********17
  44.000 )*********19
  42.000 )*********11
  40.000 )*******
  38.000 )*****
  36.000 )**
  34.000 )***
  32.000 )
  30.000 )
  28.000 )
```

MEAN 61.441
S DEV 7.779
N 1408.

"Attitude to Home" (Composition)

```
   5.100 )
   4.950 )********176
   4.800 )
   4.650 )
   4.500 )
   4.350 )
   4.200 )
   4.050 )
   3.900 )*********448
   3.750 )
   3.600 )
   3.450 )
   3.300 )
   3.150 )
   3.000 )*********445
   2.850 )
   2.700 )
   2.550 )
   2.400 )
   2.250 )
   2.100 )
   1.950 )********153
   1.800 )
   1.650 )
   1.500 )
   1.350 )
   1.200 )
   1.050 )
   0.900 )********186
   0.750 )
```

MEAN 3.195
S DEV 1.191
N 1408.

Appendix 15. Distributions of Popularity Test Scores

Popularity		Unpopularity		Overall Popularity (Popularity-Unpopularity)	
75.000	)	78.000	)	70.000	)
72.000	)	75.000	)	65.000	)
69.000	)	72.000	)	60.000	)*
66.000	)	69.000	)**	55.000	)*
63.000	)**	66.000	)***	50.000	)
60.000	)*	63.000	)*	45.000	)
57.000	)	60.000	)**	40.000	)***
54.000	)	57.000	)*	35.000	)***
51.000	)	54.000	)**	30.000	)*********13
48.000	)	51.000	)******	25.000	)*********23
45.000	)**	48.000	)****	20.000	)*********42
42.000	)****	45.000	)******	15.000	)*********95
39.000	)*	42.000	)*********	10.000	)********168
36.000	)*****	39.000	)****	5.000	)********265
33.000	)*********	36.000	)*********15	0.0	)********300
30.000	)*********17	33.000	)*********16	-5.000	)********141
27.000	)*********21	30.000	)**********	-10.000	)********137
24.000	)*********31	27.000	)*********15	-15.000	)*********64
21.000	)*********77	24.000	)*********34	-20.000	)*********42
18.000	)*********95	21.000	)*********41	-25.000	)*********19
15.000	)********108	18.000	)*********72	-30.000	)*********18
12.000	)********215	15.000	)*********65	-35.000	)*********16
9.000	)********214	12.000	)********117	-40.000	)*********
6.000	)********290	9.000	)********120	-45.000	)**********
3.000	)********190	6.000	)********254	-50.000	)******
0.0	)********103	3.000	)********266	-55.000	)****
-3.000	)	0.0	)********320	-60.000	)**
-6.000	)	-3.000	)	-65.000	)*
-9.000	)	-6.000	)	-70.000	)**
-12.000	)	-9.000	)	-75.000	)
MEAN	11.447	MEAN	9.909	MEAN	1.538
S DEV	7.788	S DEV	10.758	S DEV	14.166
N	1385.	N	1385.	N	1385.

(e) Correlation Matrices of Final Data

Appendix 16. Correlation Matrix of All Variables (Excluding Achievements)

CORRELATION MATRIX

	1	2	3	4	5
1	1.00000				
2	-0.06445	1.00000			
3	-0.06078	0.26540	1.00000		
4	0.01420	0.41362	0.17602	1.00000	
5	-0.04436	0.20045	0.31202	0.30428	1.00000
6	0.00212	0.53646	0.15752	0.30603	0.02623
7	-0.05089	0.12601	0.45112	0.04282	0.09239
8	0.04429	0.27822	0.05226	0.56698	0.15569
9	-0.02028	0.07793	0.13028	0.30339	0.42311
10	-0.05090	0.16689	0.44733	0.04001	0.08286
11	-0.07040	0.52368	0.18240	0.31022	0.08290
12	-0.01878	0.29200	0.06775	0.54159	0.19860
13	0.02742	0.04591	0.00863	0.34233	0.24830
14	0.02227	0.36627	0.13005	0.33296	0.14921
15	0.14881	0.12788	-0.01485	0.10394	-0.01307
16	-0.01314	0.17879	0.05902	0.17440	0.06083
17	0.00374	0.39135	0.11510	0.37461	0.09966
18	-0.05320	0.37919	0.22298	0.33822	0.21247
19	0.09344	0.06092	-0.00753	0.06307	0.02052
20	0.02620	0.02683	0.01931	0.01356	-0.00080
21	-0.07957	0.12031	0.04332	0.06728	0.04268
22	-0.04193	0.12358	0.03189	0.12412	0.06121
23	-0.10134	0.20983	0.11050	0.16721	0.14180
24	-0.26907	0.13712	0.13325	0.06259	0.21804
25	-0.31433	0.12986	0.13137	0.03955	0.21203
26	-0.31248	0.14213	0.14481	0.05615	0.23440
27	-0.24446	0.09105	0.07133	0.03878	0.09991
28	-0.31746	0.13266	0.11673	0.04980	0.18331
29	0.01755	0.25506	0.07620	0.22537	0.05791
30	-0.04076	0.09239	0.07636	0.06969	0.12133
31	-0.02423	0.00464	0.00843	0.02193	0.03541

	11	12	13	14	15
11	1.00000				
12	0.40107	1.00000			
13	0.05010	0.33587	1.00000		
14	0.38729	0.39318	0.16218	1.00000	
15	0.15714	0.14061	0.07536	0.29959	1.00000
16	0.17828	0.19821	0.06509	0.41830	0.34979
17	0.45049	0.43006	0.11252	0.66227	0.16549
18	0.37939	0.34633	0.12264	0.55501	0.13300
19	0.09763	0.01543	-0.05792	0.01832	0.30332
20	0.05336	0.02656	0.03184	0.13505	0.21189
21	0.08158	0.06704	-0.02148	0.14271	0.08347
22	0.07218	0.10901	-0.02048	0.11337	0.05946
23	0.17840	0.16424	-0.01964	0.23620	0.12414
24	0.03121	0.04644	-0.07981	0.01854	-0.11549
25	-0.00046	0.03987	-0.09383	0.01546	-0.15336
26	0.01370	0.04197	-0.09528	0.02033	-0.14865
27	0.02827	0.02266	-0.10571	-0.00332	-0.08807
28	0.02538	0.03640	-0.11142	0.01041	-0.13294
29	0.30626	0.30316	0.11810	0.53717	0.13329
30	0.04977	0.04645	0.03974	0.07634	0.01870
31	-0.01558	-0.01529	-0.00179	-0.02954	-0.04142

Appendix 16. Correlation Matrix of All Variables (Excluding Achievements) (cont'd.)

	6	7	8	9	10
6	1.00000				
7	0.13003	1.00000			
8	0.41826	0.02273	1.00000		
9	0.03348	0.23455	0.18895	1.00000	
10	0.15097	0.49536	0.00494	0.03612	1.00000
11	0.58341	0.12552	0.35203	0.02327	0.23518
12	0.29719	0.01750	0.57347	0.21685	0.00157
13	0.05588	0.04567	0.30376	0.44863	0.06481
14	0.37442	0.09614	0.36990	0.11708	0.14351
15	0.17510	-0.01238	0.16164	-0.00206	0.03657
16	0.18215	-0.01253	0.19659	0.03226	0.05400
17	0.43591	0.08153	0.42529	0.10629	0.09967
18	0.32426	0.16381	0.30851	0.14864	0.16977
19	0.12281	-0.05150	0.08169	-0.03173	-0.00326
20	0.05004	0.05155	0.03042	-0.03547	0.07466
21	0.06288	0.01537	0.04904	0.00924	0.04897
22	0.04871	-0.04578	0.05827	0.00803	-0.00020
23	0.12810	-0.01599	0.10635	0.04339	0.06542
24	-0.03368	0.05762	-0.05610	0.07325	0.00419
25	-0.08034	0.04367	-0.05976	0.05760	-0.01558
26	-0.06606	0.05521	-0.06272	0.06930	-0.00615
27	-0.03973	0.03148	-0.04310	0.04512	-0.01182
28	-0.05660	0.04632	-0.05671	0.06389	-0.00751
29	0.33023	0.04884	0.32135	0.05320	0.10041
30	0.01578	0.05614	0.03114	0.05991	0.09618
31	0.01638	-0.01000	0.00801	-0.00585	-0.04119

	16	17	18	19	20
16	1.00000				
17	0.30136	1.00000			
18	0.24833	0.64172	1.00000		
19	0.07621	0.06345	0.01452	1.00000	
20	0.12315	0.06890	0.09867	0.18188	1.00000
21	0.25869	0.10698	0.20166	0.03696	0.10304
22	0.28443	0.16691	0.18473	0.10851	-0.07338
23	0.44394	0.28371	0.30126	0.15565	0.02019
24	0.02861	-0.03170	0.17788	-0.01725	-0.05959
25	0.01760	-0.03473	0.17838	-0.02151	-0.05017
26	0.02182	-0.03577	0.18981	-0.02621	-0.05384
27	-0.03572	-0.02373	0.10414	0.03196	-0.02396
28	-0.01162	-0.02998	0.16742	0.00499	-0.04192
29	0.23803	0.54349	0.44320	0.00000	0.07681
30	0.06530	0.04300	0.11209	0.05151	0.06024
31	-0.06353	-0.04577	0.00537	0.04323	-0.03542

Appendix 16. Correlation Matrix of All Variables (Excluding Achievements)(cont'd.)

	21	22	23	24	25
21	1.00000				
22	0.24700	1.00000			
23	0.31128	0.41958	1.00000		
24	0.12964	0.14852	0.14602	1.00000	
25	0.10993	0.13143	0.17226	0.73682	1.00000
26	0.12507	0.14754	0.16892	0.91609	0.93984
27	0.05926	0.06727	0.08540	0.55302	0.57207
28	0.10299	0.11605	0.14552	0.80792	0.83500
29	0.06019	0.02027	0.12158	-0.03172	-0.02999
30	0.10786	0.11988	0.12307	0.18477	0.16191
31	-0.02797	0.00169	-0.01635	0.06616	0.07152

	26	27	28	29	30
26	1.00000				
27	0.60452	1.00000			
28	0.88416	0.89715	1.00000		
29	-0.03220	-0.05229	-0.04609	1.00000	
30	0.18616	0.17681	0.20761	-0.02886	1.00000
31	0.07243	0.03703	0.06371	-0.01316	-0.14053

	31
31	1.00000

Appendix 17. Correlation Matrix of All Variables (Including Achievements)(Boys)

CORRELATION MATRIX

	1	2	3	4	5
1	1.00000				
2	-0.11278	1.00000			
3	-0.04944	0.36821	1.00000		
4	-0.12885	0.49810	0.17298	1.00000	
5	0.05445	0.21029	0.22400	0.46843	1.00000
6	-0.05178	0.62509	0.27434	0.32540	0.03707
7	0.11344	0.27883	0.54491	0.09034	0.02958
8	-0.00100	0.34118	0.13053	0.62469	0.34099
9	0.01666	0.14240	0.09881	0.46912	0.55657
10	-0.01394	0.29540	0.59382	0.03704	0.00562
11	-0.04515	0.59305	0.40510	0.31389	0.08111
12	-0.07835	0.24744	0.03866	0.62036	0.34299
13	-0.05013	0.00641	0.01287	0.39245	0.43966
14	-0.16416	0.49858	0.20387	0.40075	0.15625
15	0.02166	0.17823	0.09362	0.07660	0.00787
16	-0.07365	0.24574	0.18201	0.20873	0.17699
17	-0.13166	0.42167	0.20541	0.39165	0.06498
18	-0.12628	0.44090	0.23848	0.34608	0.15848
19	0.14274	0.04899	0.04415	0.04105	0.06139
20	0.07193	-0.01696	-0.00080	-0.04878	-0.06236
21	-0.04995	0.21252	0.10180	0.24691	0.23031
22	0.08090	0.12877	0.07055	0.22152	0.20285
23	-0.11343	0.35943	0.22187	0.28532	0.29957
24	-0.16322	0.16808	0.02821	0.02829	0.14372
25	-0.12521	0.07365	-0.08984	-0.07339	0.00197
26	-0.15575	0.12815	-0.03810	-0.02847	0.07399
27	0.09715	-0.06039	0.07858	-0.15610	-0.06092
28	-0.09386	0.07597	0.00736	-0.10133	-0.00695
29	-0.11267	0.17696	0.08484	0.14043	0.30062
30	-0.05296	0.16167	0.02937	-0.00295	0.21557
31	-0.09892	0.13120	-0.04485	-0.02133	0.15364
32	-0.14702	0.16816	0.05667	0.00367	0.22598
33	-0.07229	0.39096	0.13343	0.30246	0.16449
34	0.07019	0.12694	0.14169	0.05069	0.07907
35	-0.09020	0.15823	0.07484	0.06387	0.02677

	11	12	13	14	15
11	1.00000				
12	0.32817	1.00000			
13	-0.06087	0.41259	1.00000		
14	0.43513	0.38098	0.12776	1.00000	
15	0.23898	0.10800	-0.02534	0.46352	1.00000
16	0.24409	0.16726	0.02394	0.63224	0.47932
17	0.43890	0.36755	0.08439	0.69945	0.23432
18	0.47223	0.33537	0.13346	0.66031	0.18362
19	0.13593	0.04759	-0.23216	0.11977	0.48097
20	0.13400	0.01316	-0.08340	0.09482	0.28855
21	0.22214	0.22913	0.00779	0.39588	0.22141
22	0.11033	0.18028	0.08932	0.18759	0.08565
23	0.22783	0.22206	0.03641	0.43033	0.21582
24	0.05297	0.01567	0.05363	0.13415	0.09499
25	-0.01914	0.04144	-0.07953	0.10349	0.01601
26	0.01569	0.03211	-0.01921	0.12835	0.05748
27	-0.02402	-0.10953	-0.10856	-0.07957	0.06871
28	0.03094	-0.02329	-0.08947	0.06139	0.07360
29	0.03191	0.07362	0.09342	0.11497	0.06975
30	0.00697	-0.10714	-0.05439	0.04878	0.00250
31	-0.03863	-0.08872	0.01191	0.01115	-0.07390
32	0.00633	-0.09212	-0.02091	0.05892	-0.02316
33	0.43637	0.30215	0.09675	0.59738	0.15137
34	0.04394	0.01567	-0.10960	-0.04340	0.00415
35	0.09326	0.06023	0.08911	0.04534	0.01111

Appendix 17. Correlation Matrix of All Variables (Including Achievements)(Boys)(cont'd.)

	6	7	8	9	10
6	1.00000				
7	0.25490	1.00000			
8	0.42095	0.12160	1.00000		
9	0.07385	0.16160	0.37411	1.00000	
10	0.21864	0.49636	-0.02581	-0.04650	1.00000
11	0.60724	0.32742	0.30785	0.07607	0.38782
12	0.24009	0.01330	0.67663	0.38291	-0.05758
13	-0.00278	-0.00604	0.33676	0.60286	-0.12039
14	0.41240	0.17635	0.41370	0.13411	0.20905
15	0.22119	0.01370	0.15618	-0.00653	0.12640
16	0.11021	0.05918	0.19180	0.12688	0.09382
17	0.43586	0.25673	0.44985	0.15565	0.14439
18	0.41596	0.22995	0.34456	0.08909	0.18541
19	0.17727	0.02147	0.13415	-0.01923	0.15319
20	0.04349	0.03148	0.00989	-0.03256	0.05643
21	0.10034	0.01891	0.16509	0.11983	0.01020
22	0.00719	0.03950	0.14251	0.13230	-0.00701
23	0.10721	0.07606	0.20963	0.12840	0.09089
24	0.00326	0.07664	-0.00938	0.08157	-0.03036
25	-0.02785	-0.03286	-0.07709	0.03770	-0.07480
26	-0.01458	0.01968	-0.04972	0.06333	-0.05901
27	-0.00292	0.14730	-0.07110	-0.05716	0.08363
28	0.02422	0.08756	-0.05450	-0.01120	0.00563
29	-0.02257	0.01544	0.00152	0.16679	0.03080
30	-0.01109	0.05417	-0.09324	0.03617	-0.03318
31	-0.04695	-0.08416	-0.11008	0.05428	-0.04359
32	-0.02453	-0.00071	-0.10971	0.05794	-0.00951
33	0.36485	0.19254	0.35862	0.17339	0.17869
34	-0.02885	0.06182	0.03700	0.02540	0.07553
35	0.08150	0.03926	0.09179	0.05465	0.01053

	16	17	18	19	20
16	1.00000				
17	0.42574	1.00000			
18	0.35029	0.72212	1.00000		
19	0.18290	0.04419	-0.04004	1.00000	
20	0.25499	0.01016	0.13276	0.26659	1.00000
21	0.61658	0.31724	0.33667	0.09204	0.19412
22	0.38284	0.17780	0.17609	0.03254	-0.08311
23	0.56316	0.33566	0.39201	0.14617	0.05254
24	0.26326	0.03416	0.11014	-0.07510	-0.02185
25	0.17209	0.04729	0.12786	0.00485	-0.00029
26	0.23380	0.04490	0.13040	-0.03523	-0.01124
27	0.01139	-0.10161	-0.05281	0.13022	0.05428
28	0.14614	-0.01365	0.08201	0.04761	0.00721
29	0.22380	-0.00331	0.10556	0.05524	0.03827
30	0.23144	0.00905	0.11484	-0.11339	-0.00042
31	0.11964	-0.00986	0.08391	-0.10697	0.02817
32	0.21846	0.00289	0.14123	-0.08724	-0.00328
33	0.33649	0.59531	0.49366	0.03780	0.08648
34	0.17916	-0.03339	0.04969	0.17431	0.00984
35	-0.08484	0.03343	-0.00448	0.05589	-0.02373

Appendix 17. Correlation Matrix of All Variables (Including Achievements)(Boys)(cont'd.)

	21	22	23	24	25
21	1.00000				
22	0.51702	1.00000			
23	0.69604	0.48252	1.00000		
24	0.18697	0.03936	0.28080	1.00000	
25	0.16828	-0.00787	0.26690	0.68158	1.00000
26	0.19292	0.01536	0.29799	0.90434	0.92869
27	0.01900	-0.07224	0.05893	0.25448	0.28884
28	0.12073	-0.06368	0.22568	0.77215	0.81061
29	0.25305	0.13750	0.29008	0.45182	0.39361
30	0.23263	0.17918	0.34993	0.55364	0.46689
31	0.24368	0.01169	0.26817	0.44255	0.47637
32	0.28320	0.13969	0.35772	0.59288	0.53504
33	0.21004	0.08913	0.21394	0.04236	0.05359
34	0.26024	0.15120	0.35868	0.12490	0.09636
35	-0.19611	-0.15854	-0.06601	-0.05057	-0.03480

	26	27	28	29	30
26	1.00000				
27	0.29745	1.00000			
28	0.86413	0.67936	1.00000		
29	0.45857	0.11670	0.36213	1.00000	
30	0.55291	0.18507	0.49127	0.44546	1.00000
31	0.50214	0.13958	0.41688	0.40046	0.63814
32	0.61254	0.17307	0.51327	0.65407	0.89111
33	0.05273	-0.10126	-0.02272	0.11761	-0.07227
34	0.11950	0.03431	0.12386	0.30759	0.14713
35	-0.04592	-0.11449	-0.09023	0.04200	-0.04096

	31	32	33	34	35
31	1.00000				
32	0.77849	1.00000			
33	0.00280	-0.01712	1.00000		
34	0.09170	0.20625	-0.00347	1.00000	
35	0.00807	-0.00087	0.06207	-0.22831	1.00000

Appendix 18. Correlation Matrix of All Variables (Including Achievements)(Girls)

CORRELATION MATRIX

	1	2	3	4	5
1	1.00000				
2	-0.14198	1.00000			
3	-0.12859	0.41032	1.00000		
4	0.08110	0.42309	0.10434	1.00000	
5	-0.04736	0.24561	0.07502	0.56959	1.00000
6	-0.08651	0.60278	0.33928	0.30560	0.10158
7	-0.13968	0.22662	0.37607	-0.07628	-0.00752
8	-0.07655	0.30211	0.16805	0.56011	0.34591
9	-0.00110	0.12106	-0.00867	0.29959	0.52893
10	-0.14677	0.18011	0.49518	-0.03971	0.03038
11	-0.19446	0.61105	0.28735	0.34405	0.20536
12	-0.02208	0.30967	0.04353	0.55555	0.43329
13	-0.00662	0.18719	-0.14475	0.44054	0.60410
14	-0.00663	0.50368	0.19441	0.42865	0.36576
15	0.09011	0.10144	-0.03398	0.14538	0.09688
16	-0.13147	0.28311	0.06238	0.21595	0.18488
17	-0.11937	0.52406	0.18879	0.38316	0.23135
18	-0.13997	0.56824	0.26674	0.35829	0.26317
19	0.14547	0.01325	-0.03994	0.01296	-0.00578
20	-0.09233	0.08890	-0.07455	0.05188	0.00178
21	-0.17080	0.28174	0.02311	0.09089	0.10380
22	-0.04580	0.17224	-0.03302	0.14698	0.24381
23	-0.15021	0.31207	0.16987	0.15642	0.17864
24	-0.16670	-0.12588	0.09794	-0.10303	-0.04029
25	-0.18463	-0.11864	0.04574	-0.19303	-0.08355
26	-0.18564	-0.11392	0.08745	-0.14413	-0.04721
27	-0.01442	-0.19337	0.00924	-0.03146	-0.02795
28	-0.11123	-0.18266	0.05466	-0.09824	-0.04157
29	-0.17507	0.10853	0.15513	-0.06167	-0.05374
30	-0.32069	0.07370	0.04655	-0.15319	-0.04235
31	-0.21328	-0.02443	0.09206	-0.16606	-0.03975
32	-0.33950	0.02944	0.10662	-0.15969	0.01401
33	-0.11497	0.36612	0.14834	0.35127	0.19436
34	-0.06741	0.10062	0.07958	0.13639	0.18456
35	-0.05035	0.01185	-0.05567	0.05164	0.04602

	11	12	13	14	15
11	1.00000				
12	0.43937	1.00000			
13	0.16275	0.48602	1.00000		
14	0.55093	0.46113	0.21914	1.00000	
15	0.14735	0.16061	0.03492	0.10711	1.00000
16	0.25504	0.31294	0.09778	0.33568	0.15159
17	0.55784	0.45183	0.15054	0.66324	0.09660
18	0.57050	0.39052	0.15763	0.54824	0.16285
19	0.14864	-0.02613	-0.01190	-0.04803	0.30379
20	0.15027	0.05340	0.12586	-0.01456	0.30979
21	0.23932	0.20746	0.06683	0.20606	0.11956
22	0.15457	0.25076	0.13532	0.26132	-0.03193
23	0.29676	0.19106	0.08079	0.23340	0.05257
24	-0.14517	-0.02674	-0.03807	-0.20269	-0.16377
25	-0.13996	-0.04325	-0.10201	-0.15246	-0.20869
26	-0.14822	-0.03010	-0.06552	-0.17604	-0.20438
27	-0.05142	-0.07824	-0.09529	-0.12181	-0.14065
28	-0.11405	-0.06434	-0.09507	-0.17261	-0.19978
29	0.13561	-0.04680	-0.06769	0.00268	-0.01437
30	0.10695	-0.12632	-0.10994	0.09831	-0.13301
31	0.11201	-0.11987	-0.02143	0.00483	-0.10314
32	0.09436	-0.12132	0.01873	-0.00962	-0.23019
33	0.44871	0.39692	0.14596	0.56411	0.05157
34	0.14234	0.11808	0.11712	0.10866	0.15571
35	-0.08889	-0.08384	-0.07203	-0.13664	-0.10642

	6	7	8	9	10
6	1.00000				
7	0.34015	1.00000			
8	0.32756	0.07764	1.00000		
9	0.09885	0.12714	0.21987	1.00000	
10	0.32828	0.69296	0.04693	0.11556	1.00000
11	0.65561	0.32875	0.37907	0.07991	0.36007
12	0.22266	0.01849	0.65715	0.20094	-0.03696
13	0.02639	-0.03400	0.34627	0.58304	-0.02666
14	0.47332	0.10356	0.39687	0.11973	0.18869
15	0.12549	-0.08756	0.12399	-0.02064	-0.08843
16	0.18164	0.04130	0.34907	0.08977	-0.05159
17	0.50066	0.09915	0.46356	-0.00436	0.08426
18	0.53734	0.22840	0.43816	0.10269	0.19696
19	0.14181	-0.07854	0.04397	-0.01331	0.03864
20	-0.00080	0.00070	0.04428	-0.06779	0.01819
21	0.20093	0.04674	0.23298	0.00030	0.01647
22	0.19939	-0.00073	0.28976	0.06053	0.04080
23	0.30100	0.04352	0.28358	0.04173	0.08045
24	-0.07307	-0.00729	0.03761	-0.02033	-0.04480
25	-0.13706	-0.02772	0.01195	-0.15660	-0.04484
26	-0.11191	-0.01388	0.03776	-0.09105	-0.04199
27	0.00572	-0.05042	0.01127	0.01961	0.08396
28	-0.05689	-0.04013	0.03097	-0.03768	0.02804
29	0.18533	0.12201	-0.03391	-0.03431	0.20722
30	0.06680	-0.01589	-0.06697	-0.06750	0.09511
31	-0.06573	-0.03010	-0.09245	-0.11826	0.11622
32	0.03005	0.12215	-0.06696	0.05373	0.20818
33	0.41144	0.04245	0.37987	0.05651	0.04699
34	0.03440	-0.03544	0.20296	0.04962	0.04141
35	0.04476	-0.07891	-0.02447	0.02757	-0.16571

	16	17	18	19	20
16	1.00000				
17	0.34094	1.00000			
18	0.31113	0.70109	1.00000		
19	0.03210	0.01231	0.12412	1.00000	
20	0.11271	0.09093	0.13908	0.35161	1.00000
21	0.43760	0.33622	0.42527	0.28244	0.17808
22	0.30881	0.36972	0.21703	0.08823	-0.25590
23	0.46626	0.31958	0.37991	0.29692	0.09399
24	-0.04591	-0.21132	-0.17201	-0.03606	-0.12593
25	-0.01526	-0.12079	-0.19182	-0.05789	-0.00979
26	-0.03529	-0.17384	-0.21549	-0.06426	-0.06487
27	-0.15245	-0.08126	-0.08613	0.06851	-0.00345
28	-0.11436	-0.14475	-0.17118	0.00664	-0.03830
29	0.05545	0.00282	0.04537	0.13082	-0.07392
30	0.19693	0.10327	0.04751	0.08696	-0.00343
31	0.16902	-0.04421	0.02355	-0.01566	0.04290
32	0.11791	-0.01005	0.03731	0.09649	-0.02776
33	0.30627	0.52798	0.50156	-0.08698	0.04932
34	-0.04457	0.23828	0.14092	0.00660	0.14301
35	0.02963	-0.08721	-0.04601	0.02194	-0.13330

Appendix 18. Correlation Matrix of All Variables (Including Achievements)(Girls)(cont'd.)

	21	22	23	24	25
21	1.00000				
22	0.39283	1.00000			
23	0.65559	0.44698	1.00000		
24	0.01347	0.07742	-0.06938	1.00000	
25	0.02397	0.06656	0.01733	0.68473	1.00000
26	0.00556	0.09268	-0.03149	0.89329	0.91003
27	-0.09431	-0.01124	-0.08269	0.38144	0.43144
28	-0.05554	0.04546	-0.06902	0.73324	0.77244
29	0.05496	0.12860	0.10794	0.30742	0.24365
30	0.17857	0.17285	0.19428	0.01375	0.12446
31	0.09488	0.02348	0.16442	0.02661	0.14018
32	0.17554	0.15327	0.21498	0.16801	0.18211
33	0.22749	0.15368	0.18306	-0.09051	-0.10796
34	0.13693	0.20139	0.13259	0.05569	0.10438
35	-0.02857	0.02641	0.05052	0.07737	-0.04521

	26	27	28	29	30
26	1.00000				
27	0.43388	1.00000			
28	0.82445	0.86737	1.00000		
29	0.28960	0.19637	0.28400	1.00000	
30	0.07157	0.17450	0.14731	0.41385	1.00000
31	0.08779	0.20546	0.17787	0.34767	0.54205
32	0.18028	0.18935	0.21694	0.54933	0.72697
33	-0.10484	0.01921	-0.04484	-0.02457	0.12202
34	0.11656	0.07706	0.11317	0.16575	0.16543
35	-0.00722	0.11190	0.06623	0.09086	-0.04633

	31	32	33	34	35
31	1.00000				
32	0.58092	1.00000			
33	-0.03769	0.04457	1.00000		
34	0.15649	0.24903	0.19081	1.00000	
35	-0.05050	0.05402	-0.02608	-0.23002	1.00000

Appendix 19. Rotated Factor Matrix of All Variables (Excluding Achievements)

ROTATED FACTOR MATRIX

VARIABLE	FACTOR 1	2	3	4	5	6	7	8
1	0.04094	-0.37348	-0.06526	-0.07738	0.07530	0.26141	-0.01914	0.02709
2	-0.15671	0.13591	-0.03495	0.20632	-0.13865	0.01335	0.70146	-0.00469
3	0.00252	0.11138	-0.14031	0.74501	-0.08772	-0.02475	0.16842	0.05954
4	-0.14190	0.02992	-0.56644	-0.05404	-0.09673	0.01723	0.53619	-0.00097
5	0.03025	0.20802	-0.62392	0.22871	-0.14058	0.01208	0.05093	0.07490
6	-0.23084	-0.07390	0.06563	0.13172	-0.01135	0.08474	0.75635	0.02424
7	-0.07596	0.02786	-0.10590	0.78023	0.09470	-0.01019	0.01601	-0.02612
8	-0.27290	-0.08527	-0.42202	-0.16605	0.00424	0.06612	0.56090	-0.02264
9	-0.03584	0.04325	-0.76211	0.16580	0.00386	-0.03150	-0.05462	-0.00572
10	-0.08134	-0.04210	0.02983	0.77879	-0.02094	0.03353	0.09892	-0.10084
11	-0.25166	0.01484	0.05546	0.17282	-0.04973	0.04405	0.74179	-0.04490
12	-0.31746	0.02200	-0.46235	-0.16547	-0.05214	-0.00391	0.49130	-0.06427
13	-0.12969	-0.14344	-0.73465	-0.02992	0.08009	0.01378	0.00232	-0.07657
14	-0.75753	0.00161	-0.13324	0.06912	-0.16927	0.15698	0.25822	-0.03279
15	-0.17677	-0.15475	-0.03019	-0.03758	-0.15768	0.68729	0.10076	-0.01811
16	-0.37653	-0.04628	-0.05222	-0.01807	-0.58768	0.24539	0.02859	-0.05257
17	-0.70614	-0.04674	-0.08841	0.02459	-0.18088	0.01239	0.41172	-0.01241
18	-0.64462	0.18004	-0.14514	0.17699	-0.22475	0.01713	0.26867	0.00566
19	0.23728	0.01129	0.03378	-0.04715	-0.14815	0.68641	0.23358	0.11624
20	-0.21293	-0.00765	0.02120	0.10486	0.09146	0.63246	-0.12112	-0.13408
21	-0.11625	0.08571	0.02454	0.05065	-0.56287	0.04943	-0.03034	-0.11219
22	0.06102	0.07574	-0.03429	-0.05962	-0.74558	-0.07672	0.10928	0.00934
23	-0.12435	0.11237	-0.03308	0.03310	-0.76740	0.05287	0.12297	0.00654
24	0.00071	0.87318	-0.05404	0.03788	-0.10155	-0.03694	0.00429	0.00808
25	-0.01905	0.89611	-0.04073	0.02239	-0.09612	-0.05934	-0.03001	0.02925
26	-0.01246	0.94999	-0.05133	0.03451	-0.10201	-0.05334	-0.01812	0.01882
27	0.02991	0.79664	0.02059	-0.02580	0.04842	0.05841	0.04861	-0.07924
28	0.00836	0.97083	-0.01443	0.00426	-0.02808	0.00302	0.02039	-0.03660
29	-0.75820	-0.04172	-0.03187	0.01715	0.01032	0.01780	0.19551	0.06062
30	0.09699	0.21677	-0.09834	0.08395	-0.14854	0.10797	0.07826	-0.63796
31	0.05547	0.10104	-0.04458	0.00567	0.00902	0.05060	0.02356	0.80757

Appendix 20. Rotated Factor Matrix of All Variables (Including Achievements)(Boys)

ROTATED FACTOR MATRIX

	FACTOR								
	1	2	3	4	5	6	7	8	9
VARIABLE									
1	-0.10457	-0.10574	0.03330	0.00944	0.01711	0.12291	-0.02654	0.03565	0.81220
2	0.68323	-0.02090	0.09732	0.00175	0.26652	-0.01080	0.23740	0.33355	-0.11710
3	0.16595	-0.03759	0.10463	0.08367	0.83400	0.00555	0.03023	0.10528	-0.09539
4	0.45915	-0.09182	0.63640	0.12290	-0.01749	-0.05058	-0.01100	0.25081	-0.12012
5	0.01003	-0.07093	0.73395	0.15808	0.11730	0.04174	0.28781	-0.09168	0.03788
6	0.74329	-0.01348	0.00629	-0.17981	0.14938	0.06752	-0.00133	0.29376	0.09407
7	0.22955	0.10490	0.06420	-0.01466	0.75399	-0.06472	-0.04325	-0.08162	0.21591
8	0.53662	0.00784	0.56729	0.03462	-0.10639	0.05569	-0.18795	0.22521	0.06345
9	0.03581	0.02857	0.82136	0.03420	0.09285	-0.00256	0.06194	-0.08141	0.06430
10	0.15961	-0.02528	-0.11330	-0.00409	0.80249	0.10246	-0.02721	0.04935	-0.05919
11	0.69650	-0.02606	-0.00409	-0.00660	0.33392	0.11547	0.02630	0.21030	0.03103
12	0.44206	0.06648	0.61056	0.10566	-0.18763	0.00640	-0.19774	0.16105	-0.05986
13	-0.00672	-0.02774	0.79310	-0.01946	-0.03285	-0.10667	-0.02304	-0.28138	-0.06607
14	0.71544	0.07097	0.13045	0.29510	0.08075	0.28997	-0.02392	-0.21110	-0.23218
15	0.20570	0.08826	-0.00155	0.13871	0.03894	0.76829	-0.09140	0.00550	-0.11023
16	0.28913	0.11567	0.07467	0.61642	0.06974	0.45978	0.12531	-0.17630	-0.17039
17	0.78949	0.01775	0.08322	0.24152	0.06047	0.03580	-0.07560	-0.21275	-0.07867
18	0.74576	0.05425	0.06806	0.24964	0.10677	0.00536	0.08738	-0.20599	-0.02439
19	0.00930	0.04106	-0.01856	0.00844	0.03927	0.71760	-0.12686	0.44744	0.07877
20	0.06705	-0.04902	-0.07404	0.00161	-0.01306	0.64081	0.10072	-0.17900	0.23081
21	0.23394	0.04423	0.07843	0.76070	-0.03232	0.18960	0.21199	0.01747	-0.01108
22	0.07566	-0.11017	0.14726	0.71053	0.00332	-0.05775	0.07671	0.06971	0.06617
23	0.24979	0.13944	0.12172	0.65381	0.08383	0.13215	0.26619	0.16558	-0.15657
24	0.04363	0.75225	0.08001	0.08652	0.01740	-0.00896	0.40344	-0.01751	-0.17009
25	0.06383	-0.80440	-0.04325	0.05089	-0.13263	-0.00520	0.33871	-0.00960	-0.11454
26	0.05935	0.85042	0.01532	0.07353	-0.06854	-0.00757	0.40203	-0.01448	-0.15301
27	-0.12020	0.64229	-0.06860	-0.03269	0.19346	0.11159	-0.05968	0.04825	0.32342
28	0.01362	0.94274	-0.05278	0.00529	0.03887	0.03396	0.24175	0.05227	0.03142
29	-0.04432	0.25638	0.21417	0.14908	0.06507	0.11857	0.58663	0.18811	-0.17670
30	0.01650	0.30542	-0.01901	0.16376	0.01500	-0.05602	0.80639	-0.00985	0.06992
31	0.02637	0.24216	-0.01419	0.03850	-0.09787	-0.04934	0.79807	-0.05993	0.02447
32	0.00350	0.32414	0.00744	0.14735	0.01422	-0.03874	0.88581	0.03065	-0.05134
33	0.67231	-0.00515	0.12762	0.09849	0.06823	0.09233	-0.01266	-0.18695	-0.04361
34	-0.09793	0.07892	-0.02771	0.44615	0.12084	-0.02236	0.11763	0.56787	0.04827
35	0.09960	-0.17823	0.14129	-0.49110	0.05779	0.16779	0.18250	-0.00207	-0.35063

Appendix 21. Rotated Factor Matrix of All Variables (Including Achievements)(Girls)

ROTATED FACTOR MATRIX

VARIABLE	FACTOR 1	2	3	4	5	6	7	8	9
1	-0.10190	-0.14925	-0.01077	0.32995	0.10270	0.01364	-0.14787	-0.06965	0.64871
2	0.65475	-0.10626	0.09968	-0.01536	-0.16032	0.06972	0.30717	0.12455	-0.10678
3	0.28404	0.10562	-0.08070	-0.03492	0.00999	-0.06226	0.63179	-0.00160	-0.04714
4	0.56277	-0.02982	0.54290	0.16429	0.01435	0.06573	-0.11012	0.07386	0.11096
5	0.24606	-0.01566	0.78937	-0.00462	-0.09358	-0.02607	-0.02444	-0.02858	0.02890
6	0.65680	-0.02882	-0.03414	-0.03527	-0.10827	0.09119	0.42903	0.21534	0.18759
7	0.05764	-0.03016	0.02610	0.02278	-0.02717	-0.05541	0.84127	-0.02366	-0.11869
8	0.56509	0.15629	0.38461	0.16572	-0.23120	0.03386	-0.00925	-0.09165	-0.02206
9	-0.04024	-0.06963	0.80555	-0.01176	0.00683	-0.04574	0.16894	0.09525	0.04767
10	0.06934	-0.02621	0.04226	-0.16181	0.04109	-0.00275	0.85621	-0.12081	0.05738
11	0.70095	-0.08419	0.07972	-0.12525	-0.07562	0.19981	0.36353	-0.00083	-0.03739
12	0.56508	0.06104	0.45711	0.20543	-0.15134	0.02105	-0.11393	-0.14191	-0.09410
13	0.11234	-0.05620	0.84488	0.02465	-0.02528	0.06032	-0.08048	-0.10922	-0.10177
14	0.76436	-0.15024	0.13876	-0.02756	-0.08762	-0.10799	0.06528	-0.13701	0.03316
15	0.14429	-0.15546	0.01255	0.16230	-0.06850	0.60905	-0.09684	-0.14439	0.13608
16	0.33553	-0.05721	0.09162	-0.09051	-0.55479	0.03769	-0.10546	0.09871	-0.31740
17	0.80696	-0.10330	-0.00422	-0.01147	-0.22979	-0.02068	0.01526	-0.15277	0.01345
18	0.71440	-0.13296	0.06523	-0.03104	-0.24939	0.15210	0.20246	0.00036	-0.03049
19	-0.07057	0.00079	-0.00942	-0.10213	-0.32369	0.67113	0.04410	0.12871	0.41243
20	0.04725	-0.02281	0.01728	-0.01483	0.02784	0.81464	-0.03308	-0.12956	-0.29467
21	0.20643	0.00524	-0.01183	-0.09287	-0.77986	0.20649	0.00619	-0.03816	-0.10144
22	0.20930	0.08444	0.13326	-0.09522	-0.66906	-0.33109	-0.04531	-0.13577	0.31199
23	0.22199	-0.02825	0.05410	-0.16476	-0.78470	0.12595	0.08617	0.06175	0.01029
24	-0.13584	0.86368	0.01972	0.00653	-0.07044	-0.09547	0.04897	0.04514	-0.07895
25	-0.10853	0.86628	-0.10748	-0.06281	-0.08470	-0.06176	-0.01785	-0.12257	-0.16608
26	-0.12419	0.94060	-0.02368	-0.02381	-0.07586	-0.09284	0.02196	-0.07661	-0.12963
27	0.03812	0.65676	0.00114	-0.27856	0.26118	0.08392	-0.04354	0.12126	0.29600
28	-0.04253	0.93211	-0.01701	-0.18697	0.12155	0.00115	-0.01614	0.03380	0.11473
29	0.03648	0.28133	-0.02468	-0.59186	-0.06794	0.02511	0.20973	0.09216	0.16171
30	0.07875	0.01428	-0.11054	-0.84128	-0.12753	-0.05796	-0.04398	-0.05342	-0.07382
31	-0.02407	0.04056	-0.05647	-0.75706	-0.01889	0.01723	-0.02667	-0.18320	-0.15798
32	-0.05724	0.11707	0.06613	-0.87059	-0.14416	-0.06871	0.12588	-0.01552	-0.07119
33	0.75192	-0.02460	0.03046	-0.06651	0.00109	-0.05303	-0.08201	-0.05202	-0.09168
34	0.18727	0.12823	0.13571	-0.27200	-0.04057	0.10552	-0.04828	-0.62873	0.17057
35	-0.00650	0.05742	0.04653	-0.06247	-0.03252	-0.08486	-0.14346	0.81645	0.06932

Appendix 22.

SOME AREAS FOR EDUCATIONAL RESEARCH IN HONG KONG

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SOME AREAS FOR EDUCATIONAL RESEARCH IN HONG KONG

JIMMY CHAN

Introduction

There are educational problems everywhere so it is not at all surprising to find that there are quite a number of educational difficulties inherent in the cultural-educational setup of Hong Kong. However, most of these difficulties have not been studied systematically due to lack of enough qualified trained personnel and also to a large extent lack of sufficient support. Nevertheless the following problems need to be investigated one way or another without further delay so that educational policy can be formulated in the light of the research findings. The following are some of the more important areas which have been identified for research workers to investigate.

Selection and Placement

In Hong Kong, one of the research needs seems to be in the field of selection and placement, educational and vocational guidance. It has been reported that the number of places in primary and secondary schools is less than the number of candidates of appropriate age seeking these places. The places in the universities are even more valuable. The percentages of failure in public examinations are on the whole rather great. Therefore, there appears to be a need for the effective selection of appropriate students for different courses, so that a minimum waste of tax-payers' money and students' efforts can be effected. While selection is an important factor here, one must not ignore the possibility that different teaching methods and curricula could also present major problems.

Statistics also show that the great majority of younger children are educated, and over half those of secondary age, but that only 1–2 per cent. reach university. This extremely small percentage at the higher level of education obviously justifies a careful procedure for selecting the best 'brains' from the community for training.

Intelligence Tests

One of the useful instruments for selection and placement is no doubt the intelligence test. As selection and placement are continuous processes, intelligence tests at different age levels should be constructed so that prediction of success can be more accurate. At present we are short of locally standardised intelligence tests for different age groups. Consequently, there is an urgent need for the construction and validation of intelligence and other ability tests.

Environment

As pointed out by psychologists, environment has an important influence on intellectual development, hence environmental factors should also be studied. Besides, there are other psychological and sociological factors which may well play a significant part in the students' academic achievement. In this context, a comprehensive research scheme as well as a detailed experimental design seems to be desirable and necessary.

In the development of the child, three main socialisation processes can be identified, namely his interaction with the family, school and society. The socialisation process in the family begins early in the life of the child, and has the primary effect on the child's development. Later school and society add their weight and contribute further to the child's development. Hence, it is important to look at these three aspects empirically in order to understand the child fully.

Evidence: In England, the classical study of Gordon (1923) on the intellectual ability of canal boat children revealed that they were inferior in ability to children brought up in normal surroundings. Burt (1937) pointed out that poverty, population density, family size, poor health and inadequate general knowledge were the aspects of low social class which encouraged backwardness in school. Piaget (1950) showed that intellectual operations are acquired by interaction between organism and environment in a lawful 'sequence', while Hebb (1949), from a neurological point of view, distinguished intelligence A, which is the innate genetic potentiality, neither observable nor measurable, from intelligence B, which is the present mental efficiency resulting from interaction with environment. Vernon (1960) accepted Hebb's view of intelligence A and B, but was aware that available intelligence tests are imperfect measures of intelligence B, and hence introduced intelligence C, which is that aspect B measured by intelligence tests. Cattell (1963) considered that the general factor which emerges from correlations between batteries of varied tests to be an amalgam of two components, which he called fluid and crystallised intelligence. Fluid intelligence represents the influence of biological

factors on intellectual development, whereas crystallised intelligence is the result of the skills and concepts which have become established through cultural pressures, education and experience (i.e., environment). Douglas (1964) reported that children of encouraging parents do better in all types of tests: picture intelligence, reading-vocabulary and arithmetic tests, whereas Wiseman (1967) emphasised that socio-economic class and its associated conditions of child care still make substantial difference to children's intelligence and achievement.

Research

1. *Family Conditions*

As students spend most time at home, family and social conditions in Hong Kong appear to be important to their studies. Here important traditional family issues are involved, and sociological changes including increasing westernization of homes, conflicts with older customs, are often thought to affect students' lives and work. However, systematic enquiries should be carried out in order to determine the bearing on academic success of these important factors. The family variables which might will be investigated are general socio-economic background; number of children at home;parents' incomes; availability of reading materials, television, radio, gardens, pets; family holiday outings in Hong Kong and abroad;and academic help from parents, brothers and sisters, or private tutors; happy or broken homes, loss of father or mother; small or large family; and particularly the parent-child interactions. The current sociological changes and their effects should also be studied in some detail.

2. *School Conditions*

How important are school facilities to the learning and teaching of school subjects, especially science subjects. The effect of class size has also been a controversial issue: What is the optimum number of students in a class for the Hong Kong situation? Other aspects of schools which are considered to be of some importance and should be investigated are these: types of schools, location of schools, interests and attitudes of school principals, school organisation and discipline, co-educational or single-sex, streamed or unstreamed, size of staff, teacher-teacher relationship, etc. There are such wider aspects of schooling which might have some bearing on the learning and teaching of various subjects. The area for research should include some evaluation of schools' social-educational environment in specific terms and the effect of the environmental factors on the educational opportunities and progress of various groups of students, including the disadvantaged. It is desirable that these studies should apply at some point to Hong Kong: ideally some comparisons might be possible between Hong Kong and other places in terms of these particular social-environmental issues.

3. *Peer Groups*

Students learn a lot from their friends and their behaviour is greatly influenced by group consensus of opinion and behaviour. The peer group plays such an important part in the lives of our students that we need to know more about the nature and values of the groups before we could do much to help our problem children. As pointed out by various social psychologists, adult values might have less power to produce behaviour than peer values, especially during adolescent stage. In fact, one of the deepest needs of adolescents is the need to be supported and approved by their peers rather than parents or teachers. In order to understand more of the problem of juvenile delinquency, research in this area is vital.

4. *Student Variables*

Besides intelligence, other psychological traits like personality, attitude, interest, motivation should also be examined. Psychologists agree that personality plays a very important part in students' success and it has been noted that anxiety, nervousness, emotional upsets, etc. affect students' academic results under the present very competitive examination system in Hong Kong. Also, attitudes and interests have a lot to do with academic success. Consequently, the construction and validation of personality, interest, and attitude tests should be carried out as soon as possible. In Hong Kong, life is comparatively more competitive than in other places, and therefore nearly all students are highly motivated to succeed. Parents also put great pressure on the students. But how far does such motivation affect academic success either favourably or unfavourably? Also, some students are very ambitious, i.e., they aim very high. Will this help or hinder performance? All these queries point to the need for careful psychological studies.

5. *Teacher Variables*

Are the qualifications and teaching experience of the teachers important to students' academic success in the Hong Kong situation? The socio-economic aspects of the profession should be investigated in order to find the bearing on students' success. The areas for research might include enthusiasm and satisfaction with present job, interest and attitude of teachers, their salaries, other commitments, teacher-student relationships (rapport), age, marital status, teaching methods used, and also the nature and extent of the teachers' professional training.

Conclusion

A large-scale empirical study of the factors affecting the success of students at various levels, similar to many researches in other countries, should be carried out. Such a study would not only permit better definition of criteria to be used in selecting and placing students but it would also provide a richer understanding of the influence of environmental factors. The operation required would be quite extensive, and would necessarily involve a team of interested research workers and school teachers rather than individual endeavour.

With the above researches completed, we should have a clearer picture of the specific factors for success in different fields, and our future students will therefore be better selected for certain courses and suitably placed in particular subjects. Also, a better curriculum can be planned according to the needs of our students, in line with our research findings.

Three fundamental processes are generally considered necessary for any selection and placement process: the case history, the interview, and the psychological test. The case history approach is generally used in Hong Kong, while the interview approach is sometimes used, but the psychological test approach has been very seldom used – perhaps due to social resistance. It cannot be over-emphasised that correct selection and placement procedures yield good economic returns and individual satisfaction, and that the effort spent in psychometric research is well rewarded.

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Appendix 23.

SOME PSYCHOLOGICAL ATTRIBUTES OF SCIENCE STUDENTS AND RELATED RESEARCH PROBLEMS

BY

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SOME PSYCHOLOGICAL ATTRIBUTES OF SCIENCE STUDENTS AND RELATED RESEARCH PROBLEMS

BY MR. JIMMY CHAN

INTRODUCTION

It is not uncommon to find that many students and in particular the boys in the secondary schools of Hong Kong wish to study science subjects and to take up science and technology as a career. During this 'rocket' age, science is no doubt a favourite area of investigation. However, one may ask, "Can everyone become a scientist?" Let us look at some of the typical psychological attributes of science students and hope to throw some light on this issue. There are some other related problems which will also be looked at more generally.

SOME RESEARCH FINDINGS

The learning problems involved in science education have been tackled psychologically from time to time. Daniels (1961) succeeded in separating reasoning ability in the study of Physics and found that good physics students excelled better in reasoning ability. Wolins, et al (1961) identified factors such as general intelligence and specific scientific ability in the achievements of various science subjects. Cooley (1963) reported that specific scientific ability is more important for students in higher forms than in lower forms. He also discovered that this ability is particularly important just before entry into university. This seems to suggest that Form VI is the crucial stage for potential scientists.

Cooley, et al. (1961) found that factor analysis gives quantitative evidence that science interest is not unidimensional, as has frequently been assumed to be the case for secondary school students. This appears to imply that important relationships between science interests and career choice processes can only be more firmly established upon further research. Cooley (1963) further pointed out that interest appears to be a fairly unstable dimension in lower forms, and that participation in science activities in early years does not necessarily indicate future career plans or even present plans. He also emphasized that scholastic

abilities alone are not sufficient for the selection and placement of students and suggested that one of the obviously needed additions is an instrument which assesses future educational and career plans. This together with family background data and improved interest-value tests would be a big help in the selection and placement processes in terms of school guidance and counselling particularly.

Anderson, et at. (1961) found that there was no relation between method of instruction and career plans, and that science-career students achieved better than non-career students, regardless of the method of instruction. As regards sex difference, Sweeney (1953) reported that boys are significantly better in problem-solving situations than girls.

PROBLEMS IN HONG KONG

Over a period of years, during the learning and teaching of science subjects, a number of difficult problems have been encountered and have existed till the present time. There has been little study of the nature of these problems and what could be done about them. The situation is most acute and crucial in the upper forms of the secondary schools.

Both the students and teachers are now facing more comprehensive science syllabuses. They have queries about the various topics in the syllabuses. Which of the topics are the more difficult to learn and to teach? How may these topics be properly taught and learned?

Are the following student variables important in learning science: intelligence, interests, attitudes, motivation, sex, age, activities, favourite subjects, spare-time pursuits, and future plans? They have long been believed to have bearing on the learning of science, as revealed in some of the research findings in other countries. A problem facing all school principals and administrators is: What kind of students should be selected for studying science, especially in upper forms?

Coming nearer home we want answers to the following problems: Are the qualifications of our science teachers and their teaching experience important in the Hong Kong situation? Do we have enough qualified science teachers? How should these teachers be trained? These are problems which have puzzled us for a number of years.

How important are the science laboratory facilities to the learning and teaching of science? We know that some schools are more science-biased than others, i.e., they arrange greater numbers of science periods and also offer more

science classes. Has this anything to do with the success of the science students? The effect of class size has also been a controversial issue: What is the optimum number of students in a science class? Do school internal examination results give any useful guide in forecasting students' success in public examinations?

Very often teachers are confronted with problems as to how to advise students on what science subjects they should study especially in upper forms: Biology, Chemistry, or Physics? Which of these subjects needs higher intelligence for success? Which of the following factors are more important for academic success in the various fields: verbal, non-verbal, numerical, or overall 'g'? Also, what are the degrees of relationship between the "theoretical" and "practical" aspects of the various science subjects? At present all schools select students for their science classes entirely on their achievements. This question has been open to dispute for a long time. The psychological attributes of our students could also be used for selection and placement purposes, and they might be more reliable predictors. Research suggests that the important ones seem to be intelligence, interests, attitudes, and motivation. However, psychologists now think that family background plays an even more important role in students' academic success; by this we mean socio-economic factors but particularly psychological aspects (mainly parent-child inter-action).

CURRICULUM PLANNING

All the above problems point to the need for comprehensive systemic research to identify the psychological attributes of our science students and other factors for academic success. Only when these factors are discovered can we formulate and later evaluate our science curriculum more effectively. Curriculum planning can be treated in these areas: objectives, contents, and methods. The latter two are used to achieve the first one, but the three are in fact interrelated. The objectives are (a) Formation of Concepts, (b) Acquisition of Facts, (c) Understanding of Principles, (d) Acquisition of skills, and (e) Development of the Rational Mind. The contents include different areas of knowledge and the interrelation of concepts and disciplines. The methods follow a logical sequence of concept development. Again this suggests the need to construct and validate psychological tests to find out about the formation of concepts at various stages of the development of our students. It is simply illogical and unscientific to include certain topics in a particular year of the syllabus by pure speculation or conjecture, or even on the basis of personal experience alone.

In England there is a move to break down the subject barriers which have been stultifying educational development in the schools for many decades. Enthusiastic teachers call for inter-disciplinary activity and point out that an overformal curriculum places both students and teachers in mental straitjackets, inhibiting personality and creativity. To satisfy the needs of the young people, a curiculum should be flexible, dynamic, developing, and focussed on the future rather than the past. Methods of learning need to be enquiry-based, inter-disciplinary, and creative. It would be reasonable to expect Hong Kong to be heading in this direction.

CONCLUSION

In order to train good scientists and technologists for Hong Kong, it seems that the psychological attributes of our science students should be clearly identified, and the related problems must be solved. A suitable science curriculum constructed in accordance with local educational research findings as well as on the conclusions of the foreign literature appears necessary to achieve such ends.

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